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TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1948

No. 16

MANDEL BROTHERS, INC., PETITIONER,

vs.

JOHN H. WALLACE, JR.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SEVENTH CIRCUIT

PETITION FOR CERTIORARI FILED FEBRUARY 9, 1948.

CERTIORARI GRANTED MARCH 15, 1948.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1947.

No.

MANDEL BROTHERS, INC., A CORPORATION,

Petitioner,

vs.

JOHN H. WALLACE, JR.,

Respondent.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

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In the

United States Circuit Court of Appeals

For the Seventh Circuit

No. 9261

JOHN H. WALLACE, JR.,
Plaintiff-Appellant,

vs.

MANDEL BROTHERS, INC., A CORPORATION,
Defendant-Appellee.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

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1 Pleas had at a regular term of the District Court of the United States for the Eastern Division of the Northern District of Illinois begun and held in the United States Court Rooms in the City of Chicago in the Division and District aforesaid on the first Monday of September (it being the 2nd day thereof) in the year of our Lord One Thousand Nine Hundred Forty-Six and of the Independence of the United States of America, the 171st year.

Present:

Honorable John P. Barnes, District Judge.
Honorable Philip L. Sullivan, District Judge.
Honorable Michael L. Igoe, District Judge.
Honorable William J. Campbell, District Judge.
Honorable Walter J. La Buy, District Judge.
Honorable Elwyn R. Shaw, District Judge.
Honorable William H. Holly, District Judge.
Roy H. Johnson, Clerk.
Thomas P. O'Donovan, Marshal.

Tuesday, October 1, 1946.

Court met pursuant to adjournment.

Present: Honorable William H. Holly, Trial Judge.

2 IN THE DISTRICT COURT OF THE UNITED STATES

For the Northern District of Illinois

Eastern Division.

John H. Wallace, Jr., *Plaintiff.*

vs.

Mandel Brothers, Inc., a corporation, *Defendant.*

No. 43 C 906

Be It Remembered, that the above-entitled action was commenced by the filing of the following Complaint in the office of the Clerk of the District Court of the United States for the Northern District of Illinois, Eastern Division, on this the 29th day of September, 1943:

3 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

COMPLAINT.

The plaintiff, John H. Wallace, Jr., for his complaint, alleges:

I.

John H. Wallace, Jr., is a citizen of the United States and a resident of Princeton, New Jersey.

II.

The defendant, Mandel Brothers, Inc., is a corporation existing under and by virtue of the laws of the State of Delaware, and has a regular and established place of business in the city of Chicago, Illinois, within the Northern District of Illinois, Eastern Division, at which place and elsewhere within the United States the acts of infringement herein complained of have been committed.

4 III.

This is a civil action for infringement of letters patent and is based upon the patent laws of the United States.

IV.

On March 25, 1941 United States Letters Patent No. 2,236,387 were duly and legally issued to plaintiff, John H. Wallace, Jr., of Princeton, New Jersey, for an invention in a perspiration inhibiting composition; and since that date plaintiff has been and still is the owner of said Letters Patent.

V.

The defendant, Mandel Brothers, Inc., has been and still is infringing the aforesaid Letters Patent No. 2,236,387 by selling perspiration inhibiting compositions embodying the invention described and claimed in said Letters Patent and will continue to do so unless enjoined by this court.

Wherefore Plaintiff Demands:

A preliminary and final injunction against further infringement by defendant and by all those controlled by defendant.

An accounting for the profits accruing to defendant and damages suffered by plaintiff by reason of defendant's infringement.

5 An assessment of costs against defendant.

John H. Wallace, Jr.,
doing business as
Wallace Laboratories,

By Chritton, Wiles, Davies, Schroeder & Merriam
141 West Jackson Blvd., Chicago,
His Attorneys

Charles J. Merriam
Russell Wiles
George A. Chritton
Of Counsel

And afterwards on, to wit, the 29th day of June, 1945, came the Parties by their attorneys and filed in the Clerk's office of said Court their certain Stipulation in words and figures following, to wit:

PLAINTIFF'S EXHIBIT 10.

UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

STIPULATION.

It is stipulated by and between the parties hereto as follows:

1. Plaintiff agrees to confine his charge of infringement to the anti-perspirant and deodorant known as "Ever-Dry" manufactured and sold by Ever-Dry Corporation, a corporation of Nevada, having a place of business at 1248 South Hope Street, Los Angeles, California, this agreement to continue so long as Ever-Dry Corporation conducts or controls the defense of this suit.

2. It is stipulated and agreed that defendant has sold said product "Ever-Dry" since before the filing of the Bill of Complaint herein.

3. Ever-Dry Corporation is assuming and conducting the defense of this suit against Mandel Brothers at its expense and under its control.

4. Service of any and all notices, motions, and other documents directed to the defendant shall be upon Slieridan, Davis & Cargill, 135 South La Salle St., Chicago 3, Illinois, as attorneys for the defendant, so long as Ever-Dry Corporation is conducting the defense of this suit and so long as said attorneys are in charge of such defense.

5. The anti-perspirant and deodorant "Ever-Dry" as sold by defendant prior to the filing of Bill of Complaint herein is compounded of a number of ingredients, including the following:

Approximately 53% water
Approximately 7% Urea
Approximately 7% Aluminum Sulfocarbolate
Approximately 7% Aluminum Sulphate
Approximately 6.6% Aluminum Chloride
Approximately .7% Magnesium Oxide

The balance of the compound being ingredients that do not modify the action of those specified.

6. Ordinary soft copies or photostatic copies of United States Letters Patents, foreign patents, and publications may be introduced as evidence by either party hereto with the same force and effect as the originals or certified copies thereof, and the dates of grant, publication, and of application appearing thereon shall be accepted as prima facie correct, subject to correction, should such be in order.

7. At the trial plaintiff will rely upon claims 1 to 6, 8 to 13, all inclusive, and 15 and 16 to show infringement of United States Letters Patent 2,236,387.

8. Plaintiff shall have a reasonable time within which 9 to prepare and file supplemental bill, if such be deemed advisable.

9. Defendant shall have twenty days after the filing of such supplemental bill and/or particulars, within which to file a supplemental answer thereto.

10. The stipulations heretofore entered into between the parties, on or about February 17, 1944 and August 28, 1944 are hereby revoked and terminated insofar as they are inconsistent with the provisions of this stipulation and it is agreed that no other stipulations or agreements heretofore entered into between the parties hereto shall be hereafter binding upon the parties, except such as relate to extensions of time for filing the pleadings or the like.

11. This stipulation shall not bar either party from introducing evidence not in conflict with the provisions hereof.

Chritton, Wiles, Davies, Schroeder & Merriam,
Attorneys for Plaintiff

Sheridan, Davis and Cargill,
Attorneys for Defendant

Dated: June 26, 1945.

10 And afterwards on, to wit, the 14th day of November, 1945, came the Defendant by its attorneys and filed in the Clerk's office of said Court its certain Amended Answer in words and figures following, to wit:

11 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

AMENDED ANSWER.

The defendant, answering the plaintiff's complaint herein, states:

1. It is without knowledge or information sufficient to form a belief as to the truth of the averments set forth in paragraph "1" of the complaint herein.

2. It admits that Mandel Brothers, Inc., is a corporation existing under and by virtue of the laws of the State of Delaware, and has a regular and established place of business in the City of Chicago, Illinois, within the Northern District of Illinois, Eastern Division, and denies each and every other allegation contained in paragraph "11" of the complaint.

3. It admits that the plaintiff's alleged cause of action is based upon an alleged charge of infringement of letters patent and upon the Patent Laws of the United States.

4. It admits that on March 25, 1941, Letters Patent of the United States No. 2,236,387 were issued to one John H. Wallace, Jr. for an alleged invention entitled "Per-
12 spiration Inhibiting Composition," and is without knowledge or information sufficient to form a belief as to the truth of each and every allegation contained in paragraph "IV" of the complaint.

5. It denies each and every allegation contained in paragraph "V" of the complaint.

6. Defendant alleges that it has not been given due notice of the alleged infringement. And this defendant, further answering, says that said Letters Patent No. 2,236,387 are void by reason of the following special matters:

(a) That for the purpose of deceiving the public, the description and specification filed by said John H. Wallace, Jr. and Wilfred C. Hand in the Patent Office, was made to contain less than the whole truth relative to their alleged invention or discovery or more than is necessary to produce the desired effect.

(b) That said Letters Patent were surreptitiously and unjustly obtained for that which was in fact invented by others who were using reasonable diligence in adapting and perfecting the same, to wit:

W. Kedzie Teller, of Riverside, Illinois;
Jules V. Montenier, of Chicago, Illinois;
Grace W. Carlson, of St. Paul, Minnesota;
Joseph Narrel Shipp, of Wilmington, Delaware

(c) That said John H. Wallace, Jr. and Wilfred C. Hand were not the original and first inventors or discoverers of any material or substantial part of the thing pat-
13 ented and that the following are the names and residences of the person who have had knowledge and made use of the thing patented and of every material and substantial part thereof prior to the alleged invention thereof by the said John H. Wallace, Jr. and Wilfred C. Hand, and the names and places where such uses were had and known:

W. Kedzie Teller, of and at Riverside, Illinois, and at other places, the said W. Kedzie Teller having duly filed application for Letters Patent in the United States Patent office, entitled "perspiration Inhibiting Composition";

Jules B. Montenier, of and at Chicago, Illinois, and at other places, the said Jules B. Montenier having duly filed application for Letters Patent in the United States Patent Office, entitled "Astringent Preparation";

Grace W. Carlson, of and at St. Paul, Minnesota, and at other places, the said Grace W. Carlson having duly filed application for Letters Patent in the United States Patent Office entitled "Antisudorific Deodorizing Shaving Cream";

Joseph Harrel Shipp, of and at Wilmington, Delaware, and at other places, the said Joseph Harrel Shipp having duly filed application for Letters Patent at the United States Patent Office, entitled "Chemical Process";

and many others, whose names this defendant has not yet ascertained but which it asks leave to insert in this Answer as soon as ascertained.

(d) That the thing patented in said Letters Patent has been patented and described prior to said John H. Wallace,
Jr.'s and Wilfred C. Hand's supposed invention or
14 discovery thereof in and by the following Letters Patent granted to the following named person and in and by the following publications, to wit:

United States Patents.

No. 1,371,822, issued to Lena H. Tate, on March 15, 1921;
No. 1,666,082, issued to Albert Bodmer, on April 17, 1928;
No. 1,907,424, issued to Paul Manning, on May 9, 1933;
No. 2,011,292, issued to Ernest Koch, on August 13, 1935;
No. 2,069,711, issued to Edmund C. Misshach, on February 2, 1937;
No. 2,087,161, issued to William C. Moore, on July 13, 1937;
No. 2,145,583, issued to Grace W. Carlson, on January 31, 1939, filed in the United States December 6, 1934;
No. 2,174,534, issued to Joseph Harrel Shipp, on October 3, 1939, filed in the United States April 22, 1936;
No. 2,230,082, issued to Jules B. Montenier, on January 28, 1941, filed in the United States April 22, 1938.
Q. I, 998,576, issued to Heberlein, on April 23, 1935.
No. 1,693,926, issued to Horsfall et al. on December 4, 1928.
No. 1,669,016, issued to O'Neill on May 8, 1928.
No. 1,545,931, issued to Weeks on July 14, 1925.
No. 1,634,974, issued to Bucci on July 5, 1927.
No. 1,744,061, issued to Sulzberger on January 21, 1930.
No. 507,279, issued to Leonard on October 24, 1893.
No. 514,838, issued to Schupplaus on February 13, 1894.
No. 1,090,641, issued to Nathan et al. on March 17, 1914.
No. 1,510,348, issued to Snelling on September 30, 1924.
No. 1,867,035, issued to Stocker on July 12, 1932.

British Patent.

No. 444,254 of September 17, 1934—I. G. Farbenindustrie Aktiengesellschaft.
No. 778,548 of September 17, 1934—I. G. Farbenindustrie Aktiengesellschaft.

Publications.

Goodman—"Cosmetic Dermatology" (1936) page 438.
"Perfumes, Cosmetics and Subject" by W. A. Poucher, Volume 1, 3rd Edition, page 23, published 1929, by Chapman & Hall, London 1930.
American Druggist, page 28, dated October, 1925.

Chemical Industries, March 1936—Crystal Urea, Its Industrial Uses, p. 237 (Berliner).

Chemistry of Urea, pp. 37 to 39 inclusive (Werner—London, 1923).

Organic Chemistry—A. F. Hollemann, 1930 Edition, page 335 (Wiley & Sons).

and in many others, which this defendant has not ascertained, but which it asks leave to insert in this Answer as soon as ascertained.

(e) That the claims of said Letters Patent are broader than the alleged invention set forth in the specification.

(f) That the said alleged invention was made by one only of the two joint applicants.

16 (g) That the said Letters Patent did not set forth the manner and process of making, constructing, compounding and using the alleged invention purported to be patented in and by said Letters Patent number 2,236,387, in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which it appertains to make, construct, compound and use the same.

(h) That the said Letters Patent did not distinguish it from other inventions or improvements and the said inventors have not particularly pointed out and distinctly claimed the part, improvement or combination which they claim as their alleged invention or discovery.

(i) That the said alleged improvements are not useful, nor have they any utility for the purposes set forth in the said Letters Patent.

(j) That the said alleged invention set forth in said Letters Patent constitutes a mere aggregation and does not constitute invention.

(k) That the claims of the said Letters Patent are not distinct.

(l) That the thing patented by said Letters Patent has been in public use and on sale in this country for more than two years before the said John H. Wallace, Jr.'s and Wilfred C. Hand's application for a patent and that the persons hereinabove named as having had prior knowledge and use of said alleged invention and many others knew of such use and sale, as did said John H. Wallace, Jr. and Wilfred C. Hand.

17 (m) That plaintiff and patentees of the patent in suit have unreasonably neglected to disclaim those parts of said patent in suit which are invalid and which they were not entitled to patent.

7. And this defendant, further answering, says that said Letters Patent did not disclose or show any invention whatsoever in view of the state of the arts relating to cosmetics, perspiration inhibitors, astringents and many other products and compounds as they existed long before the time when it is alleged in said complaint that said John H. Wallace, Jr. and Wilfred C. Hand made their alleged invention; and that in view of the state of the arts, the said John J. Wallace, Jr. and Wilfred C. Hand did not in their said Letters Patent disclose any new, or patentable invention whatsoever, but that the alleged invention involves, if anything, simply ordinary skill and judgment.

Wherefore the defendant states that the plaintiff is entitled to no relief whatsoever and prays that the plaintiff's complaint herein be dismissed, with costs.

Mandel Brothers, Inc.
By Sheridan, Davies and Cargill,
Attorneys for Defendant.

Thos. H. Sheridan,
Of Counsel,
135 South La Salle Street,
Chicago, Illinois.

Receipt of a copy of the foregoing amended answer acknowledged this 13th of November 1945.

Charles J. Merriam,
Attorney for Plaintiff.

18 And afterwards on, to wit, the 3rd day of January, 1946 came the Defendant by their attorneys and filed in the Clerk's office of said Court their certain Motion For Leave to Amend Amended Answer in words and figures following, to wit:

19 UNITED STATES DISTRICT COURT.

* * (Caption—43-C-906) * *

MOTION FOR LEAVE TO AMEND AMENDED ANSWER.

Now comes the Defendant, Mandel Bros., Inc., by its attorneys and moves that its Amended Answer be amended as follows:

(1) By rewriting sub-paragraph (1) of Paragraph 6 as follows:

(1) That the thing patented by said Letters Patent had been in public use and on sale in this country more than two years before the said John H. Wallace, Jr., and Wilfred C. Hand filed the application for the patent in suit by Carter Products, Inc., and by Carter Products, Inc., doing business as Feminine Products, New York, New York, and also by the said John A. Wallace, Jr., of Princeton, New Jersey, doing business as Wallace Laboratories at New Brunswick, New Jersey.

(2) By inserting in Paragraph 7 of the Amended Answer, line 9, after "arts" the following:

as represented by the patents and publications set forth in Paragraph 6, sub-paragraph (b) and as represented by the prior knowledge use and sale set forth in Paragraph 6, sub-paragraph (1) above, (whereby Paragraph 7 as amended will read as follows)

20 7. And this defendant, further answering, says that said Letters Patent did not disclose or show any invention whatsoever in view of the state of the arts relating to cosmetics, perspiration inhibitors, astringents and many other products and compounds as they existed long before the time when it is alleged in said complaint that said John H. Wallace, Jr. and Wilfred C. Hand made their alleged inventions and that in view of the state of the arts, as represented by the patents and publications

set forth in Paragraph 6, sub-paragraph (b) and as represented by the prior knowledge, use and sale set forth in Paragraph 6, sub-paragraph (1) above, the said John H. Wallace, Jr. and Wilfred C. Hand did not in their said Letters Patent disclose any new, or patentable invention whatsoever, but that the alleged invention involves, if anything, simply ordinary skill and judgment.

Sheridan, Davis & Cargill,
Thos. H. Sheridan,
Attorneys for Defendant,
135 So. LaSalle Street.

Receipt of a copy of the foregoing motion is acknowledged this 2nd day of January, 1945.

Charles J. Merriam.

Plaintiff agrees to the filing of the above amendment to the amended answer, subject to the conditions stated by the Court at the trial of the cause.

Charles J. Merriam,
Attorney for Plaintiff.

21 And afterwards on, to wit, the 1st day of April, 1946 there was filed in the Clerk's office of said Court a certain Transcript of Proceedings, Portions of Which Viz.: Page 1; Page 12 to bottom of page 41; Page 49 to page 87, inclusive; Page 93 to Page 199, line 3, inclusive, are in words and figures following, to wit:

22 IN THE DISTRICT COURT OF THE UNITED STATES.

(Caption—43-C-906)

TRANSCRIPT OF PROCEEDINGS

had and evidence taken in the above-entitled cause, before the Honorable William H. Holly, one of the Judges of said Court, in his courtroom in the United States Court House, at Chicago, Illinois, commencing on Thursday, December 20, 1945, at 10:00 o'clock a.m.

Present:

Chritton, Wiles, Schroeder, Merriam & Hofgren (141 W. Jackson Blvd., Chicago, Ill.), by Charles J. Merriam, Esq., of Counsel, on behalf of Plaintiff;

Sheridan, Davis & Cargill (135 S. La Salle St., Chicago, Ill), by Thomas H. Sheridan, Esq., of Counsel, on behalf of Defendant.

23 By Mr. Merriam: I should like to offer first, your Honor, the deposition of Dr. Wallace and the deposition of Mr. Hand, which were taken in New York two weeks ago. This may be a little out of order, but their depositions cover two grounds. I do not think they need be marked an exhibit.

By the Court: Let them be marked as an exhibit, first.

By Mr. Merriam: Exhibit 8. There are three exhibits with that, namely, Exhibit 1, which is the patent in suit, Exhibit 2, which is a page from the notebook of Dr. Wallace. I have the original notebook here, but it was agreed that we could use instead a photostatic copy of page 151 of the record in the New York case. The original is here for inspection, if desired. And Exhibit 3 is a sample of the

product "Arrid", which is made by Dr. Wallace and sold by Carter Products Inc., under the patent.

(The said patent in suit, No. 2,236,387, was received in evidence as PLAINTIFF'S EXHIBIT 1.)

(The said photostatic copy of page from the notebook of Dr. Wallace was received in evidence as PLAINTIFF'S EXHIBIT 2.)

24 (The said sample of "Arrid" was received in evidence as PLAINTIFF'S EXHIBIT 3.)

(The deposition of Wilfred C. Hand, and the deposition of John H. Wallace, Jr., taken at New York, New York, December 6, 1945, were received in evidence as PLAINTIFF'S EXHIBIT 8.)

By Mr. Merriam: I think, if it is in accordance with your practice, we could save time by not having these depositions read, but have them stand as a part of the record.

Is that satisfactory to you, Mr. Sheridan?

By Mr. Sheridan: Yes.

By the Court: All right.

By Mr. Merriam: I may say, in brief, it covers testimony essentially to carry the Wallace date back of another party, Montenier. It may or may not be necessary ever to discuss it, but I want it here.

I should also like to offer, as Plaintiff's Exhibit No. 9, a printed copy of the record in the case of *Wallace* v. *Woolworth*, which is the litigation I referred to in the Second Circuit.

By Mr. Sheridan: I do not object to offering the record, but I do object to its contents being relied upon

25 insofar as they may be inadmissible in this particular proceeding. Defendants have been unable to obtain a copy of the file wrapper of the patent in suit, and Mr. Merriam has very kindly agreed we may utilize the printed copy in the record.

By the Court: Very well.

By Mr. Sheridan: There may be other portions properly available to both sides.

By Mr. Merriam: I am not offering it as evidence of anything contained in the record. I am offering it to show what the record was in the New York case. From time to time I think we will save ourselves and the Court some difficulty by using parts of it as evidence, but that we can do when the time comes.

(The said document was received in evidence and marked PLAINTIFF'S EXHIBIT 9.)

By Mr. Merriam: I should like to offer as background a sample of "Odorono" liquid purchased on the market recently, as Plaintiff's Exhibit No. 4.

(The sample of "Odorono" was received in evidence and marked PLAINTIFF'S EXHIBIT 4.)

By Mr. Merriam: And a sample of the deodorant
26 "Mum", purchased recently on the market, as Plaintiff's Exhibit 5.

By the Court: They may be admitted.

(The sample of "Mum" was received in evidence and marked PLAINTIFF'S EXHIBIT 5.)

By Mr. Merriam: A sample of the product "Ever-Dry", which is the material in complaint here, as Plaintiff's Exhibit 6; and I may say that this is just offered to show the form of package. We have a stipulation covering the analysis of the contents.

By the Court: Very well.

(The sample of "Ever-Dry" was received in evidence and marked PLAINTIFF'S EXHIBIT 6.)

By Mr. Merriam: And, as Plaintiff's Exhibit 7, a sample of "Fresh", which is a product made under the patent in suit, likewise, to show the form of the package and the material.

By Mr. Sheridan: I assume there will be some proof to establish that fact as to "Fresh"?

By Mr. Merriam: Yes.

By the Court: They will all be admitted.

27 (The sample of "Fresh" was received in evidence and marked PLAINTIFF'S EXHIBIT 7.)

By Mr. Merriam: I also should like to offer, as Plaintiff's Exhibit 10, the stipulation which is on file with the Clerk, the customary stipulation as to soft copies, and so forth.

By the Court: Very well.

By Mr. Merriam: It also stipulates that the product "Ever-Dry" contains approximately 53 per cent water, 7 per cent urea, 7 per cent aluminum sulfocarbolate, 7 per cent aluminum sulfate, 6.6 per cent aluminum chloride, and .7 per cent magnesium oxide. That does not add up to 100, but it is also stipulated that the ingredients that make up the balance of the compound do not modify the action of those specified.

I may say that each party has certain technical information regarding their creams, and so forth, which they did not feel it is necessary to reveal to each other.

By the Court: It will be admitted.

(The document was received in evidence and marked PLAINTIFF'S EXHIBIT 10.)

28 W. KEDZIE TELLER, called as a witness on behalf of the Plaintiff, having been first duly sworn, testified as follows:

Direct Examination by Mr. Merriam.

Q. 1. State your name, address, and present occupation.

A. W. Kedzie Teller. My home address is 67 North Delaplain Road, Riverside, Illinois, and I am Secretary and Director of the Columbus Laboratories, 31 North State Street, Chicago, Illinois.

Q. 2. Are you a chemist, Mr. Teller?

A. I am a chemist, with degrees of B.S. and Chemical Engineer, from the University of Missouri.

Q. 3. When did you receive those degrees?

A. In 1922.

Q. 4. What has been your occupation since 1922?

A. Since 1922, I have been employed continuously by the Columbus Laboratories.

Q. 5. In what capacity?

A. To begin with, as a routine analytical chemist, progressing on through research, and finally at my present position as Director and Chief Chemist.

Q. 6. What is the business of Columbus Laboratories?

29 A. Columbus Laboratories is a consulting chemical organization which makes analyses of such products as food products and cosmetics, does research to develop new products in each of these fields, and also does analytical and control and research work in allied industries.

Q. 7. Are you also connected with the Pharma Craft Corporation?

A. I am retained by the Pharma Craft Corporation, 113 West Hubbard Street, Chicago, as Production Manager to the extent of having control of their product and directing their research.

Q. 8. Does the Pharma Craft Corporation make the product "Fresh", which is Plaintiff's Exhibit 7?

A. They do.

Q. 9. Does the product "Fresh" contain aluminum chloride?

A. Yes, it does.

Q. 10. Is that product inhibited by urea?

A. It is

Q. 11. Is it made under license, under the patent in suit?

A. Yes, it is.

Q. 12. Do you have a copy of the patent there?

A. Yes, I have.

30 Q. 13. Will you explain the patent to the Court?

A. To begin with, the Wallace patent discusses the state of the art of stopping perspiration. At the time that he started working on his particular problem, he shows that for years it had been known that salts of such metals as aluminum chloride and aluminum sulfate had been used for stopping or controlling the flow of perspiration under the arms.

He also points out that, while they did this effectively, certain persons were sensitive to the acid reaction which was a necessary part of their function.

He also points out that attempts had been made to control this highly acid reaction through the use of alkaline material such as sodium borate, but that, in adding these alkaline materials, the acidity of the salts was so reduced that their effectiveness in controlling perspiration was diminished greatly.

Recognizing the problem, then, we have on one hand a material which must be highly acid in order to function as a non-perspirant, or an antiperspirant, and such high acidity causes irritation, and at the same time will also cause corrosive destruction to fabric. He discovered that

the addition of urea, a simple compound which is
31 known as Carbamide, and which has the formula NH_2CONH_2—

By Mr. Sheridan: Would you mind speaking just a little bit louder? It is hard to hear you.

By the Witness: Yes, sir.

A. (Continuing.) He discovered that the addition of this compound urea did not influence the said reaction of the aluminum sulfate or aluminum chloride, and hence deter their effect in stopping perspiration, but it did, for

some peculiar reason, combine with the highly acid products that resulted through the action on the skin and prevent irritation of certain individuals, and also prevent the rotting of fabric.

By Mr. Merriam:

Q. 14. Is this matter of irritation a universal matter, or does it occur in only a small proportion of cases?

A. It is not universal. Some people can use these products without any harm. On the other hand, some people can use them for some length of time without any harm, and suddenly become sensitive to them.

Q. 15. Does he suggest any other ingredients as being suitable for astringents than aluminum chloride and aluminum sulfate?

A. Yes, he also mentions salts of zinc, cerium, zirconium, titanium, iron, bismuth, tin, lead and cadmium
32 can also be used for this purpose.

Q. 16. In actual practice, do you know whether any of those are used?

A. No, they are not used commercially.

Q. 17. Are there any other acids besides the chloride and the sulfuric acid which may be used in combination with the aluminum, that he lists?

A. He mentions phosphoric acid.

Q. 18. You mentioned the acid reaction of aluminum chloride and aluminum sulfate in solution. Will you state more fully what it is that causes that acid reaction?

A. Certain salts, when dissolved in water, ionize, that is, they tend to break up into positive and negative ions. Aluminum chloride, for instance, being dissolved in water, there is a tendency for the salt aluminum chloride to ionize into Al ions, which are positively charged, and Cl ions, which are negatively charged. The water itself, even without the presence of any salts, also ionizes to a slight degree into positively charged hydrogen ions and negatively charged OH ions.

When we have a salt of a weak base, such as aluminum, and a strong acid, such as sulfuric acid, one of the
33 properties of that salt in solution is that it produces a highly acid reaction. In the case of aluminum chloride, a 10 per cent solution will have a pH of approximately 2½. In the case of aluminum sulfate, for instance, a 25 per cent solution will have a pH of about 2.7; both highly acid concentrations.

As I mentioned, there are, in any of these solutions of salts, all four of the ions present, the H, and OH, from the water, and the aluminum and the chloride, for instance, from the salt aluminum chloride. There is a tendency for the aluminum ions to combine with the OH ion of the water. This causes the formation of an insoluble, aluminum hydroxide, which is very little ionized, and tends to stay in that condition. This means that there is a releasing, therefore, of chloride ions which tend to combine with the H ions which have also been released from combination through the aluminum combining with the hydroxide ions. The result is the formation of free hydrochloric acid, which is the irritating material we are discussing in this particular combination. The tendency for this free hydrochloric acid to remain in solution is overcome by the presence of urea. For some reason or other, the urea seems to take it out of the battle, and prevents it from as-
34 serting its corrosive or irritating action.

Q. 19. Have you any cloth samples which illustrate the effect of the corrosiveness of aluminum chloride?

A. Yes, I have.

Q. 20. Will you produce those?

A. I might mention that whereas these materials, particularly aluminum chloride, will affect such fabrics as cotton, and rayon, an acetate, when in contact with them at room temperature, its effect is quite slow, it might take a period of three or four days before the cloth is noticeably tenderized, when the concentration of aluminum chloride is in contact with the cloth.

On the other hand, if we elevate the temperature, such as we do in ironing, the corrosive effect is almost instantaneous. In other words, a person ironing a blouse or a cotton garment with sufficient heat to take the wrinkles out will decompose the fabric, or decompose the salt to a point where it will decompose the fabric, during that same normal ironing operation.

In order to demonstrate, therefore, the effectiveness of adding such materials as urea to solutions of either aluminum sulfate or aluminum chloride, we applied some of the solutions in question to a piece of ordinary cotton sheeting, and ironed this piece of sheeting with an
35 iron at ordinary ironing temperatures, and we can actually measure the degree to which that rotting has occurred, if any, by putting the ironed piece of cloth in a machine that can pull the cloth, stretch it, with a certain predetermined number of pounds pressure, and we can

determine the exact point or the exact number of pounds pull required to rupture the cloth.

For simple demonstrations, an accurate determination of the degree of rotting is not necessary, because it is so evident in the case of aluminum sulfate alone, or aluminum chloride alone.

I have here a piece of cloth that I have placed a small amount of a 10 per cent solution of aluminum chloride on, and ironed with an iron, and if your Honor will put your finger on that point, stick your finger sort of through the cloth, you will find that it will rupture immediately, it has been rotted to a point where it is useless.

By Mr. Merriam: I would like to have that marked Plaintiff's Exhibit 11, and offer it in evidence.

(The piece of cloth was received in evidence and marked PLAINTIFF'S EXHIBIT 11.)

36 By the Witness:

A. (Continuing.) In contrast to the effect of the aluminum chloride on cloth when ironed, here is a piece of cloth which has a combination of aluminum chloride with urea. You will find that the point in the middle where the material was applied is just as strong as the rest of the cloth.

By Mr. Merriam:

Q. 21. Each of those was ironed by you in the same manner, was it?

A. Yes.

Q. 22. With the same iron?

A. With the same iron, under the same identical conditions.

By Mr. Merriam: I would like to offer the last one as Plaintiff's Exhibit 12.

(The piece of cloth was received in evidence and marked PLAINTIFF'S EXHIBIT 12.)

By the Witness:

A. (Continuing.) Paralleling the effect of aluminum chloride is the effect of aluminum sulfate. In other words, without the presence of urea it rots readily when ironed.

37 By Mr. Merriam: I would like to offer the aluminum sulfate sample as Plaintiff's Exhibit 13.

(The piece of cloth was received in evidence and marked PLAINTIFF'S EXHIBIT 13.)

By the Witness:

A. (Continuing.) In contrast to that, with the urea, the strength of the cloth is maintained at its normal level.

By Mr. Merriam: I would like to offer the last one as Plaintiff's Exhibit 14.

By the Court: Those exhibits are all admitted.

(The piece of cloth was received in evidence and marked PLAINTIFF'S EXHIBIT 14.)

By Mr. Merriam:

Q. 23. These likewise were prepared and ironed by you?

A. Yes.

Q. 24. Under corresponding conditions?

A. Yes.

Q. 25. By the way, is this ironing test a standard test in the industry for corrosiveness?

A. So far as I know, this ironing test was developed by the Good Housekeeping Institute, to make certain that
38 the products they were advertising in their periodical should come up to the claims of the manufacturers, and it is really a beautiful test, in that it can be controlled so accurately it tells us immediately whether we are accomplishing the effect we are after.

Q. 26. Have you also carried out tests with aluminum chloride, for example, which were not accelerated as to time?

A. Yes, I have.

Q. 27. Where were those tests carried out?

A. I placed some crystals of aluminum chloride in a four-ounce glass bottle which had a rather large opening, the opening was about an inch in diameter. I wrapped a piece of cotton sheeting similar to those which were just discussed around the cork that I placed in the opening of the bottle so that the sheeting would be in contact with any fumes that might develop, that might be trapped on the inside of the glass bottle. After a period of about three weeks, I removed the cork with the cloth, and the same damage had been done to the cloth as was noticed on those samples which I ironed.

Q. 28. How far was it from the solution in the bottle to the cork?

A. A matter of perhaps two inches.

39 Q. 29. Was that same experiment repeated, with urea in the solution?

A. With urea in the solution, I carried on a similar experiment to this, that, even after six months, there was absolutely no effect on the cloth.

Q. 30. Will you describe the "Ever-Dry" product, which has been stipulated here?

A. An analysis which I made of a jar of "Ever-Dry" cream purchased at Mandel Brothers in Chicago had a composition quite similar to that stipulated. The amounts of ingredients in general were slightly higher. The cream showed some signs of being dried out, so that the water was lower and the other constituents were higher than those mentioned, but in approximately the same proportion. In other words, there was aluminum sulfate present to the extent of slightly over 7 per cent, aluminum chloride to the extent of about 7 per cent, urea approximately 7 per cent, aluminum sulfo-carbolate in an amount which was not accurately determined because of the difficulty of this particular analysis but proven, insofar as its presence was concerned, and traces of magnesium in combination with sulfate. It could have been originally placed there as an oxide, but later apparently it reacted with one of the sulfate radicals, and formed magnesium sulfate.

Q. 31. Have you made tests upon the "Ever-Dry" product of the proportions shown in the stipulation, with and without urea?

A. Yes, I have.

Q. 32. Will you state what those tests showed?

A. I made ironing tests similar to the ones recently described, and found that when urea was present with the proportions of the other ingredients approximating those stipulated, the cloth was practically maintained at its original strength. Without the urea, the cloth was immediately and badly rotted under the ironing test.

Q. 33. What are the astringent materials in the stipulated "Ever-Dry" composition?

A. In the order of their effectiveness, aluminum chloride, aluminum sulfate, and the least effective, aluminum sulfocarbolate.

Q. 34. Does the fact that the three of them are used in combination affect the action of any one of the three individually?

A. So far as is known, they would all function as if they were present separately.

Q. 35. What is the corrosion inhibiting compound in that composition?

41 A. Urea is the corrosion inhibiting compound.

Q. 36. In your opinion, is the stipulated "Ever-Dry" composition an effective antiperspirant?

A. It is an effective antiperspirant.

Q. 37. The stipulation shows that there is 0.7 per cent of magnesium oxide in "Ever-Dry", and your own tests found some. Will you state what the function of the magnesium oxide in that composition is?

A. The experiments which I have conducted bore out my conclusion to the effect that magnesium oxide, when placed in the solution of a strong acid salt like aluminum chloride or aluminum sulfate, reacted immediately with either one or the other, and merely took out a small proportion of either the sulfate or the chloride; in other words, just reducing the concentration of the effective ingredient by the amount that the magnesium oxide would combine with the aluminum chloride or aluminum sulfate, which is a negative amount. In other words, it would take out probably .1 per cent of the total ingredients in this particular cream.

Q. 38. In other words, if you had not used the magnesium oxide, you could have had an equally effective antiperspirant with less of the astringent material?

A. That is right.

42 Q. 39. Do you know whether "Ever-Dry" ever had any other composition as an antiperspirant?

A. I was aware of a liquid called "Ever-Dry" as long as five or six years ago, and I have recently purchased a bottle of that same liquid.

Q. 40. What did that consist of?

A. That was a solution of aluminum chloride only. It contained no material that would affect its bodily characteristics, and it was highly corrosive to fabric.

Q. 41. Some time ago, you described the fact that the Pharma Craft Corporation made the product "Fresh", and you also stated you were in charge of the production of that material. Can you give us the figures of the production of "Fresh" in each of the years from 1937 to 1944, inclusive, and 1945 up to date?

By Mr. Sheridan: I object to that as irrelevant and immaterial.

By the Court: I shall admit it, and determine later what the ruling will be.

By Mr. Sheridan: I would also like to object on the ground it is calling for secondary evidence.

By Mr. Merriam: The records are available, your Honor. Perhaps the witness had better tell you what the records are, and if counsel wants to see them, he is
43 welcome to see them.

By the Court: All right.

By Mr. Merriam:

Q. 42. What records are these taken from?

A. In the manufacture of "Fresh Cream Deodorant," we make up batches of 100 to 150 pounds, and for each one of these batches, we make up a production record. These production records are numbered consecutively, and kept, because there may have been minor changes in the percentage of water over a period of years, and we like to be able to refer back to them.

Q. 43. Are those under your control?

A. Those records are under my control in the Chicago office of Pharma Craft Corporation. I examined those records recently and compiled this data, which shows the number of pounds of this product which were manufactured in the years 1937 to date.

By Mr. Merriam: I think under the circumstances, your Honor, with the records available if they wish to examine them, they should be admissible. There are thousands of these little sheets. It is a compilation from them.

By Mr. Sheridan: I do not think it is particularly important, your Honor. I do not want to delay the
44 trial of the case. I will just let my objection stand of record.

By the Court: All right.

By Mr. Merriam:

Q. 44. Will you go ahead?

A. In 1937, the total amount of "Fresh" produced was 7400 pounds. In 1938, 18,700 pounds. 1939, 20,800 pounds. 1940, 29,800 pounds. 1944, 84,000 pounds. 1942, 167,900 pounds. 1943, 228,000 pounds. 1944, 294,300 pounds. 1945, up through the 12th of December, 326,300 pounds. In other words, during this period of 1937 to 1945, the production of "fresh" increased from the comparative figure of 7 to 326.

Q. 45. 326 is not quite a full year, either, is it?

A. That is right, it is not.

Q. 46. Outside of the minor changes in amount of water,

were there any other changes in that composition during that time?

A. The early production of "Fresh" was made from an entirely different composition, but beginning the latter part of 1937, we used the present composition, and from then on until to date.

Q. 47. So the 7400 figure for 1937 covers two different compositions?

45 A. That is right, it does.

Q. 48. But the other figures all cover the composition shown by Plaintiff's Exhibit 7?

A. Yes.

By Mr. Merriam: That is all.

Cross-Examination by Mr. Sheridan.

Q. 49. As I understand your testimony, Dr. Teller, the product "Fresh" is licensed under the patent in suit, is that correct?

A. That is correct.

Q. 50. Is Pharma Craft contributing in any manner to the prosecution of this lawsuit?

A. Yes, they are.

Q. 51. They are assuming prosecution, is that correct?

A. Yes.

Q. 52. And you have some patents under which "Fresh" is licensed, do you not?

A. They are not under them at the present time. They are owned by Pharma Craft Corporation.

Q. 53. But they are patents which you solicited and obtained in your name, is that correct?

A. That is right.

46 Q. 54. Is the substance of those patents incorporated in the manufacture of "Fresh"?

A. The substance of one of the patents is used in the manufacture of "Fresh."

Q. 55. So that the product "Fresh", concerning which you have testified, not only embodies in theory the disclosure of the patent here in suit, but also that of a patent which you obtained?

A. That is right.

Q. 56. You referred to the inhibiting action of urea in these compounds or compositions, as I recall your testi-

mony. Is the term "corrosion inhibiter" a fair term to use for urea in such use?

A. Lacking anything better, I think it is descriptive.

Q. 57. It would be apt in describing the function of urea in these aluminum salt compounds?

A. If one enlarges upon the entire statement, that is, to anyone who understands exactly what we are talking about, it would cover the field, I think.

Q. 58. The product "Fresh" is extensively advertised, is it not?

A. Yes, it is.

Q. 59. How long has that advertising been in force
47 and effect?

A. I would not know too much about that. I am only concerned with the manufacture.

Q. 60. But in recent years, it has been quite aggressively advertised?

A. It has been advertised in the last four or five years.

Q. 61. You have no knowledge of the sums of money, or approximate sums of money that were spent in such advertising?

A. No, I do not.

Q. 62. Do you utilize the radio, as well as the public prints?

A. There has been a radio program.

Q. 63. The quality of the ingredients used in a preparation such as "Fresh," and the methods of compounding, have much to do with the quality of the product, do they not?

A. Do you mean the purity of the material?

Q. 64. Well, the general quality. That is, the purity of the ingredients, for example, has much to do, has it not, with the quality of the ultimate product?

A. Not necessarily. In other words, we could use commercial aluminum chloride or commercial urea and
48 get the same ultimate effects that we do from chemically pure material. There might be some disadvantages. There might be lead or arsenic in the commercial materials.

Q. 65. But you use the ordinary commercial grade of constituents, is that right?

A. No, we use the pure materials which are specified either in the National Formulary or United States Pharmacopoeia, because, under Federal regulations, we must use

materials that are comparatively free from lead and arsenic.

Q. 66. And the compounding has much to do, has it not, with the quality of your product?

A. One must follow the procedure accurately, otherwise the proportions in the final make-up of the product would be variable.

Q. 67. But skill and care are essential to satisfactory results, are they not?

A. Oh, yes.

Q. 68. And you emphasize to the public, do you not, that a high decree of skill and a high quality of constituents are used in "Fresh"?

A. Not to my knowledge.

Q. 69. You merely sell it as an antiperspirant?

49 A. As an effective antiperspirant.

Q. 70. And you yourself applied for a patent on the composition for antiperspirant purposes which utilized salt of aluminum metal and urea, did you not?

A. Yes.

By Mr. Merriam: If your Honor please, that is objected to as not being within the scope of the direct, and out of order here. I did not introduce this witness on a matter of priority of patents.

By Mr. Sheridan: I think it goes to the weight of his testimony, his tie-up and his contact with the patentees of the patent in suit.

By the Court: It may. I do not think it makes much difference.

By Mr. Merriam: If that is as far as it goes, I have no objection. Mr. Teller was involved in an interference with Wallace and Hand, and he gave a concession of priority. I have no objection to that fact being brought out, but if he goes farther than that, I object.

By Mr. Sheridan: I want to go this much farther:

By Mr. Sheridan:

Q. 71. The subject matter of the interference in 50 which you were involved related to the use of urea in an antiperspirant compound, did it not?

A. Yes, it did.

Q. 72. And that was something you thought you had invented and filed an application for patent upon, is that right?

A. That is right.

By Mr. Sheridan: That is all.

By Mr. Merriam: No redirect.

(Witness excused.)

By Mr. Merriam: I should like to offer, as Plaintiff's Exhibit 15, a group of photostats which are made from books which I have here, which are a survey of sales in the deodorant field made by the Modern Magazines since 1937 —they have made it since 1934, I am offering it since 1937— showing the relative sales as determined by questionnaires given by them, in the manner shown in one of these, for "Arrid," "Mum," "Fresh," "Odorono" and "Ever-Dry" cream.

I am offering that because of the fact that while both "Fresh" and "Arrid," which are made under the patent, have been shown, one through Mr. Teller and the other through Dr. Wallace, to have increased their sales
51 enormously since the introduction of material under this patent, it is also a fact that cosmetics as a whole have increased during that period, and I wish to show what the relative position of these compositions in the trade is.

By Mr. Sheridan: Your Honor, this rather catches me by surprise, but, superficially, or at first glance, it seems to me much of it, if not all of it, is immaterial and irrelevant. We have a stipulation providing for the offer of photostatic copies of publications, so, on the basis of any part of this being copies, I cannot object, but as to its materiality I certainly object. Some of it, incidentally, appears to be merely a typewritten collation of figures certainly not from any publication, at least it would not appear to be.

By Mr. Merriam: I have the publication here.

By Mr. Sheridan: These are figures of sales, and there are so many factors to be considered if we are going into the sale of antiperspirants. The witness has just testified that more than one patent is involved in the manufacture of "Fresh," on which they have statistics. That may be true of a number of other patents. I do not
52 think they can tie in increasing sales of cosmetics and antiperspirants to this patent in suit. I think it is too remote. It certainly sounds immaterial.

Your Honor knows well that commercial success is only important if there is a question as to the patentability, but I think this is so far beyond any direct pertinence or

direct connection to the patent in suit that it is wholly improper.

By Mr. Merriam: This form of evidence is the same form that was offered and accepted in the Ray-O-Vac case, that was paid a great deal of attention to by the Supreme Court in sustaining the patent, because there, as here, the sales of batteries generally had gone up following the war period, and it was necessary to show that the sale of the product involved had not only maintained its position, but had gone beyond the others in the field.

By the Court: I think for that purpose it is admissible.

(The document was received in evidence and marked PLAINTIFF'S EXHIBIT 15.)

By Mr. Merriam: That closes my prima facie case, your Honor.

53 S. M. REBER, called as a witness on behalf of the Defendant, having been first duly sworn, testified as follows:

Direct Examination by Mr. Sheridan.

Q. 1. Will you give your name?

A. S. M. Reber.

Q. 2. Your age and residence?

A. I am fifty-seven years old. I live at 1700 Fairoaks Avenue, South Pasadena, California.

Q. 3. And what is your occupation, Mr. Reber?

A. I am the Vice-President and General Manager of the Ever-Dry Corporation.

Q. 4. How long have you been associated with Ever-Dry Corporation?

A. Since October 1931.

Q. 5. And that corporation is the manufacturer and distributor of "Ever-Dry," complained of in this proceeding?

A. That is right.

Q. 6. Was the Ever-Dry Corporation manufacturing and selling an antiperspirant in 1931?

A. Yes, sir.

Q. 7. What kind, generally?

54 A. A liquid.

Q. 8. And have they continued the manufacture and sale of such antiperspirant?

A. Yes, sir.

Q. 9. To date?

A. Yes, sir.

Q. 10. Does that vary materially from the liquid antiperspirant which was being put out in 1931?

A. No; it is the same.

Q. 11. There is no urea utilized in that, is there?

A. No; sir.

Q. 12. It is primarily a solution of aluminum chloride and water, is that correct?

A. Yes, sir.

Q. 13. Will you state briefly the evolution and development of the cream antiperspirant "Ever-Dry," which is complained of in this case?

A. We started experimenting on cream "Ever-Dry" in 1936, and we did not produce a product that was ready to sell, but in 1937 we put one on the market, early in 1937 I think it was, and have been selling it ever since.

Q. 14. Did that 1937 cream contain anything such as urea, or what we term corrosion inhibiters here?

55 A. We had some things in it, borax and sodium lauryl sulfate.

Q. 15. Which were intended for a similar purpose?

A. Yes.

Q. 16. When, or about when, did you turn to the use of urea in "Ever-Dry"?

A. Late that fall of that year, 1937.

Q. 17. And you have continued its use to date?

A. That is right.

Q. 18. Some mention has been made that magnesium oxide is also used in your "Ever-Dry" cream. Is that correct?

A. Yes, sir.

Q. 19. Do you know the purpose for which that is used?

A. We seemed to get a lower acidity in our cream when we added magnesium oxide.

Q. 20. That is, you reduced the acidity?

A. That is right.

Q. 21. Today, do you still use magnesium oxide?

A. Yes, sir.

Q. 22. Together with urea?

A. That is right.

Q. 23. In your connection with the Ever-Dry Corporation, do you get about the country considerably?

A. Yes, I do. I travel a lot.

56 Q. 24. Has that been the case since 1931?

A. Yes, sir.

Q. 25. And in your travels and in your business functioning, do you pay any attention to the advertising of competitive products?

A. Yes, I do.

Q. 26. Is serious consideration given, or casual?

A. Oh, I try to cut all of the ads from the papers that I see. We watch the papers to see if dealers are advertising various products, we watch the displays to see what activity there is generally in our field, what our competitors are doing.

Q. 27. Has that been your practice since 1931?

A. Yes, sir.

Q. 28. Have you had any contact with advertising of "Arrid"?

A. I don't understand.

Q. 29. I say, have you had any contact with the advertising of "Arrid"?

A. I have seen a great deal of it.

Q. 30. Advertising of it?

A. Yes, sir.

Q. 31. Would that include ads in the public prints, newspapers, and so forth?

57 A. Yes, sir.

Q. 32. I hand you herewith a photostatic copy of page 73, part 7, of The Chicago Sunday Tribune, dated May 17, 1936, in which I have blocked out in red an advertisement of "Arrid", and will ask you if that is typical of advertising which you have seen at or about that time?

By Mr. Merriam: I object, your Honor, to the introduction of the advertising. I have no objection to it being shown that there was advertising, but what is in it I do not think is material to this case.

By the Court: Would the character of the advertising, the contents, have something to do with the sales?

By Mr. Sheridan: More than that, your Honor. They are making claims for "Arrid", which was the "Arrid" devised before that of the patent in suit. Those claims are substantially identical with those which are made in the subsequent advertising of the product.

By the Court: I do not know that is material.

By Mr. Sheridan: It discredits their testimony that this anticipating "Arrid" was corrosive.

58 By Mr. Merriam: I am not responsible for what somebody said about "Arrid". "Arrid" was not advertised by the Plaintiff.

By the Court: No, unless their clients are responsible for this advertising.

By Mr. Merriam: My client was available. He testified he was not.

By Mr. Sheridan: He was thoroughly and intimately connected with the distributor of "Arrid". He was the compounder of "Arrid", and was working for and with Carter Products, which distributes it.

By Mr. Merriam: He made the material, and sold it to Carter Products.

By the Court: If the advertising is by Carter Products, then I do not think he is responsible for it, that is, that the Plaintiff is responsible for it, if the advertising was by some distributor.

By Mr. Sheridan: I would say, your Honor, it certainly carries back to Wallace and Hand. Hand was employed by Carter Products, they were working for Carter Products, and this was Carter Products' product, and the patent is involved in it just as much to Carter Products as it is to Wallace.

By Mr. Merriam: Mr. Hand had worked for Carter
59 Products before the invention. He was hired from them by Wallace, and he worked for Wallace at the Wallace Laboratories during the time the invention was made. Hand has no interest in the patent, never has had. He assigned his half-interest to Wallace.

Wallace made the material and sold it to Carter Products, who marketed "Arrid".

Later, about two years ago, Mr. Wallace became an officer of Carter Products, but he was not at the time this was made.

By the Court: You can put it in under the rules, if you want to, but under those circumstances, I would say that the contents of the advertising, unless you were contending that the advertising was of a character that helped the sales, to promote sales, would not be admissible.

By Mr. Merriam: This was the old product?

By Mr. Sheridan: This was the old product, yes.

By Mr. Merriam: This is not the product in suit.

By the Court: I do not think that has anything to do with it.

By Mr. Sheridan: I am going to make the offer, at least, of this advertisement, as discrediting the implications
60 in the testimony of Plaintiff's witnesses that this anticipating "Arrid", or early "Arrid", was corrosive of cloth, because the ads contain the definite statement that it does not rot clothes. So that I shall make the offer of that sheet of advertising from The Chicago Tribune, and also of page 25 of the issue of Friday, June 19, 1936, as typical of the advertisement being then circulated and published on behalf of this product which is manufactured by the same people who manufacture the present-day "Arrid".

By Mr. Merriam: My objection stands as to both.

By the Court: Yes. The objection is sustained.

By Mr. Sheridan: May those be marked for identification as Defendant's Exhibits A and B?

(The documents referred to were marked, respectively, Defendant's Exhibit A for identification, and Defendant's Exhibit B for identification.)

By Mr. Sheridan:

Q. 33. Did you or your company ever receive notice of the infringement of the Wallace, et al., patent here in suit prior to a time some time after the institution of this proceeding?

61 A. No, sir.

Q. 34. The notice that you had was from Mandel Brothers, was it not?

A. That is right.

Q. 35. And that was about when?

A. About a year ago.

By Mr. Merriam: That is objected to as immaterial, and I move to strike it, your Honor. The defendant is not Ever-Dry. The defendant is Mandel Brothers, and notice to Ever-Dry, I think, is immaterial.

By the Court: Yes.

By Mr. Sheridan: It is stipulated that Ever-Dry is assuming the defense of this suit.

By the Court: I do not think that makes the evidence competent, does it?

By Mr. Sheridan: It may be, if it should go into an accounting, I should say.

By the Court: We have not come to that. That might be.

By Mr. Sheridan:

Q. 36. In the manufacture and sale and use of the "Ever-Dry" liquid antiperspirant during your association with Ever-Dry Corporation, what would you say as
62 to the amount of complaint received from users, customers?

By Mr. Merriam: That is objected to.

By the Court: Complaint from whom?

By Mr. Sheridan: Received from users or customers.

By Mr. Merriam: I object to that as not the proper way to prove it, your Honor.

By the Court: It does not seem to me quite right. Still, I will allow the evidence to stand for what it is worth.

By the Witness:

A. Oh, very little complaint.

By Mr. Sheridan:

Q. 37. Is that the situation today as to your liquid antiperspirant?

A. Yes, sir.

Q. 38. Do you or does your company ever receive complaints from users of your cream "Ever-Dry"?

A. Infrequently.

Q. 39. How, in volume or proportion, would they compare with complaints as to the liquid antiperspirant?

By Mr. Merriam: Same objection.

By the Court: I will allow the evidence to go in.

63 By the Witness:

A. There is really not much difference.

By Mr. Sheridan: Direct examination closed.

Cross-Examination by Mr. Merriam.

Q. 40. You mentioned sodium lauryl sulfate as being one of the materials you put in your cream. That is a wetting agent, is it not?

A. I think it is.

Q. 41. Do you know whether it is alkaline or not?

A. No.

Q. 42. You stated you added it to control the corrosiveness of the aluminum chloride. Do you know that it controls the corrosiveness in any way?

A. No, I do not know.

Q. 43. Is the same thing true as to borax which you mentioned?

A. Yes.

Q. 44. In relationship to this magnesium oxide, did you ever make any test to see what would be the effect if you leave out magnesium oxide, and also leave out some of your astringent material, compared to what it is now?

A. No.

64 Q. 45. On these complaints that you testified about on the liquid, did any of those complaints involve rotting of clothing?

A. Yes.

Q. 46. Did you ever receive such a complaint on the cream?

A. Yes.

Q. 47. That the cream has rotted clothing?

A. Yes.

Q. 48. Have you investigated those complaints?

A. They are so minor we do not usually do that.

Q. 49. What is your custom? Do you settle them?

A. Yes.

Q. 50. Do you believe that your "Ever-Dry" material, your cream, is corrosive to clothing?

A. Why, I do not know.

Q. 51. Do you ever advertise it as noncorrosive?

A. I do not think so.

Q. 52. In selling it, do you tell the people to whom you sell it that it is noncorrosive to clothing?

A. No. We say that it is the least harmful of any we know of.

Q. 53. Do you compare it to "Arrid" or "Fresh" in corrosiveness?

65 A. Oh, no.

Q. 54. When you say it is the least harmful, what do you mean?

A. Of any others, of which we have knowledge.

Q. 55. You know about "Fresh", don't you?

A. No, I do not know much about "Fresh".

Q. 56. You do not know about "Arrid"?

A. I know that it is sold.

Q. 57. What are the others of which you have knowledge?

A. Well, "Arrid", I have some knowledge of that, that it is sold, it is a big seller. "Fresh" is a good seller.

Q. 58. You tell people that yours is less corrosive than "Arrid" or "Fresh"?

A. Oh, no. I do not say that.

Q. 59. I am trying to get what you do say. You say you tell people that it is less corrosive than any others you know of. Are those your exact words?

A. Well, in an ordinary sales talk we say we have tried to protect it with ingredients to cut down the deleterious effect on fabrics, and if there are any others on the market that do a better job of stopping perspiration, or are less deleterious to fabrics, we do not know what they are, we are selling "Ever-Dry".

66 Q. 60. When you make that statement, do you believe it?

A. Oh, of course I do.

Q. 61. On the matter of the ads that you said you were familiar with, did you ever see any ads for "Odorono"?

A. Yes.

Q. 62. Or for "Mum"?

A. Yes.

Q. 63. They are very extensively advertised, are they not?

A. Yes.

Q. 64. Is your material advertised, your cream?

A. We use a different form of selling. I do not know whether you would call it advertising or not.

Q. 65. Periodical advertising?

A. We do not use the so-called forms of advertising, newspaper advertising, advertising over the radio, advertising in magazines. We do not do that.

Q. 66. You do word-of-mouth advertising through your salesmen, is that it?

A. That is what we try to do, yes.

Q. 67. As a matter of fact, do you know any successful product in the cosmetic field that is not highly advertised in one way or another?

A. I cannot recall many now.

Q. 68. They are all advertised extensively, are they

67 not?

A. Oh, not all. I cannot say all, because I do not know all of them.

Q. 69. All that you know are advertised extensively, are they not?

A. No, not all are advertised extensively.

Q. 70. Can you think of some that are not?
A. I dare say there are some that are not.
Q. 71. Can you name one?
A. Well, ours is not advertised extensively. I would consider ours as a successful operation.
Q. 72. Have the sales of your "Ever-Dry" cream been increasing since you put it on the market?
A. Yes, sir. Right from the beginning, yes.
Q. 73. How have they increased, compared to the liquid?
A. The liquid is going faster than the cream right now.
Q. 74. From 1937 to the present time?
A. The cream is the largest seller.
Q. 75. You started from zero in 1937?
A. That is right.
Q. 76. And the liquid at that time was already established?
A. I would not say established. We were just get-
68 ting under way then.
Q. 77. I thought you said you began to sell it in 1931?
A. We did, but we were just getting under way. I do not think these lines are established as quickly as that.
Q. 78. Isn't it a fact that generally in the cosmetic field a large appropriation for advertising is considered the ordinary thing?
A. Why, I imagine so.
Q. 79. You do not know, though?
A. No, no, I have no knowledge of that.
By Mr. Merriam: That is all.
By Mr. Sheridan: No redirect. That is all, sir.
(Witness excused.)
By Mr. Sheridan: I should like to make of record, your Honor, the fact that, as I mentioned before, while we have had an order for a certified copy of the File Wrapper and contents of the patent in suit, it has been before the Patent Office for a month or a month and a half, we still have not received it, so that by arrangement with opposing counsel, I should like to state that we will have to rely for
the present, at least upon the printed record in the
69 Woolworth case, beginning with page 287, and continued through to page 363. Possibly it would be in order, if and when the certified copy comes in, to put it in evidence, if that is agreeable.
By the Court: Yes.

By Mr. Merriam: Either way. I am perfectly satisfied to have it stand on this printed copy we have.

By the Court: That will be a little easier to read, if I have to read it, than the photostat.

By Mr. Sheridan: We can go ahead on that basis. Possibly I had better give that the exhibit number Defendant's Exhibit C in case we do supply it.

By the Court: All right.

By Mr. Sheridan: Mr. de Navarre, will you take the stand, please?

M. G. de NAVARRE, called as a witness on behalf of the Defendant, having been first duly sworn, testified as follows:

Direct Examination by Mr. Sheridan.

Q. 1. Will you give your full name, age, residence and occupation?

A. M. G. de Navarre. I live at 404 Lathrop Road, in Gross Pointe Farms, Michigan. I am thirty-six years of age, and a consulting chemist by profession.

Q. 2. Will you state briefly such experience, education and so forth you may have had which qualifies you to testify as an expert in this proceeding?

A. My training is pharmaceutical. In 1929, I received the Degree of Pharmaceutical Chemist, and in 1930 the Degree of Bachelor of Science in Pharmacy, from Wayne University College of Pharmacy. Since that time I have been a consulting chemist. My work is largely concerned with the developing of new products and the reading of the literature, and general advice to people in the product and cosmetic industries. I have been a special instructor in cosmetics at the Wayne University College of Pharmacy for about eight years. I have been and still am an expert consultant to the War Department, Engineer Board. I am a member of the Committee of Experts of the American Pharmaceutical Association, and of the Recipe Book Committee of the American Pharmaceutical Association. I believe that covers it.

Q. 3. Have you written any books or articles?

A. I have written two books. One has been published, and is entitled "The Chemistry and Manufacture of Cos-

metics". That is published by the D. Van Nostrand Company. Another book, partly published, manuscript uncompleted, is entitled "The Production, Control and alysis of Cosmetics".

Q. 4. Does your work as a consultant entail much of analytical character?

A. We do analyses on products that are on the market, p posted on what these products contain, how they vary m time to time, to find what new they are putting into ngs, variations in composition. In other words, we are ays looking for the novelties that may be put in.

Q. 5. Have you read and do you understand the disure of the Wallace and Hand patent here in suit?

A. I do.

Q. 6. Please state briefly what you understand to be essential disclosure of that patent.

A. The Wallace and Hand patent covers a perspiration ibiting composition containing as its essential active redient aluminum sulfate, and a corrosion inhibiting redient or an acid inhibiting ingredient of which urea a type. The purpose of the urea, apparently, is to in ne way prevent the action of the acid either on cloth or on skin. Does that cover it?

Q. 7. Is acidity, or an acid environment, essential to the proper functioning of such antiperspirants as minum sulfate?

A. I do not believe it is. I think acidity might be a uable asset in that it may cause swelling of the skin, d thereby retard or stop perspiration, but I do not beve it is essential.

Q. 8. In your opinion, in the formulae disclosed in the tent in suit, would there be an acid environment, or acid ndition?

A. There should be an acid condition there of a pH of proximately 2.7 or 2.8. I may be off a deciman there. d with the urea, the pH will vary according to the amount urea added, there will be a slight increase in the pH, nging it up to a pH of approximately 2.9 or 3., thereby utralizing or preventing a manifestation of the acid, or pH resulting from the acid by reaction of the urea with acid liberated upon the hydrolysis of the aluminum fate.

Q. 9. Please state if you will just what you understand be the functioning of urea as a corrosion inhibiter or acid inhibiter in this product in the patent in suit?

A. The ureas is a very weak base. It has the fac-
73 ulty of forming addition compounds with many ingredients, including the acids of salts such as aluminum salts. Apparently, the urea reacts with the acid, and, as disclosed in the patent in suit, it takes a certain amount of urea to react with the complete amount of acid possible to liberate from a given amount of aluminum sulfate. That acid is apparently bound up in the form of a urea, in this case, sulfate, and that material characteristic of the salts of urea ionizes less readily, and apparently holds on to the acid quite tenaciously, and prevents this manifestation of acidity when it comes to destruction of fabric or skin.

Q. 10. That is, it would neutralize any corrosive effect on fabric?

A. Yes, it would neutralize the corrosive effect on fabric, depending upon the amount of urea added.

Q. 11. What would be the action if the heat of an iron were applied to fabric carrying some of this preparation of the patent in suit, in your opinion?

A. At room temperature, urea does not ionize, but at elevated temperatures its ionization proceeds quite rapidly until boiling is reached. At that temperature, urea hydrolyzes and gives off ammonia.

In the patent in suit, the ammonia would undoubt-
74 edly have a neutralizing action on any acidity there, forming either an ammonium sulfate, or a complex ammonium sulfate, neither of which would have the destructive action on the fabric that the straight aluminum sulfate without the urea would have.

Q. 12. In other words, the destructive effect, in your opinion, is eliminated by this ionization of the urea, is that correct?

A. That is not necessarily true. The ionization increases with increasing temperature. At normal room temperature there is comparatively little ionization. At room temperature, the urea simply behaves as a base and unites with the acid to form, in this case, a urea sulfate. At the elevated temperature, the urea does ionize, forming some ammonium carbonate, which breaks down, the ammonia being released, and the ammonia then reacting with the acid, and possibly with some of the aluminum salt, forming either one or both compounds previously mentioned.

Q. 13. And the reaction of the released ammonia with the acid particles would neutralize such particles?

A. I believe so. That is right.

Q. 14. I call your attention to an article from a
75 magazine, "Industrial and Engineering Chemistry", for May, 1936, pages 517 to 521, inclusive, the title of the article being "Crystal Urea Industrial Development and Properties", by J. F. T. Berliner, and ask you if you have read that publication?

A. Yes, I have.

Q. 15. Do you find any support for your theory of the action of urea in the preparation of the patent in suit in that article?

By Mr. Merriam: Your Honor, I want to object to that question. I have no objection to offering prior art as prior art, but to offer prior art as teaching a fact of chemistry or anything else is not, in my opinion, proper, and I have Illinois cases to support it. A magazine cannot be used for anything except to show it was published at that time, whether it is scientific information or not.

This witness can say what he says, but to try to say that somebody else has said it, it is not subject to cross-examination, and is not proper.

By Mr. Sheridan: I think it adds up to the same thing, your Honor. If the statements of the properties of
76 urea are in here, they are part of the prior art.

By Mr. Merriam: It is prior art that somebody said it, but it is not prior art that it is a fact.

By the Court: If the publication shows it is prior art, it is admissible.

By Mr. Sheridan: We consider it part of the state of the art. It is not a direct anticipation, obviously, but it is our contention that it does show the state of the art, the knowledge of the properties of urea.

By Mr. Merriam: I apparently have not made myself clear to Mr. Sheridan that I object to the publication as proving any fact as to the properties of urea.

By the Court: Why couldn't I take magazine articles in learned publications as proof of facts which they state? For example, can't I take an article in the American Association Medical Journal as correct, as stating the properties of some substance?

By Mr. Merriam: No, not if there is any dispute about it. Jones On Evidence says:

77 "According to the clear weight of authority, scientific books and treatises cannot be received as evidence of the matters and opinions which they contain."

It goes on and explains why. If is only hearsay. If it is a matter that comes within public knowledge, yes, but where it is a matter of controversy, it cannot be received.

By the Court: Is there much controversy here as to the effect of urea?

By Mr. Merriam: Not as to its effect—not as to its ultimate effect. But as to what this witness says as to the way it acts, there is controversy.

By the Court: As I understand it, the contents of this publication do not go to any further fact, but this witness testifies as an expert, or is expected to, as I understand it, that from these facts he would draw certain conclusions.

By Mr. Sheridan: I would say that he finds support for his opinion as to what takes place, in the publications which are a matter of common circulation.

By the Court: Then I think simply the publication
78 is admissible.

By Mr. Sheridan: I do not know that it is necessary for him to point to this or that. We can do that ourselves.

By the Court: Yes, that is right.

By Mr. Sheridan: I offer the article in evidence as Defendant's Exhibit D.

(The document was received in evidence and marked DEFENDANT'S EXHIBIT D.)

By Mr. Sheridan:

Q. 16. Will you now direct your attention to the patent to Schupphaus, 514,838, of February 13, 1894, and state whether or not you have read and understand the disclosure of that patent?

A. Yes. I have read the patent, and am acquainted with the disclosure. The object of the patent is apparently to prevent decomposition of nitro compounds such as are used in making gunpowder; said nitro compounds being derived from the polyatomic alcohols in which urea is used as an acid inhibiting agent or a neutralizing agent to prevent decompostion. The patentee states—

By the Court:

Q. 17. Where, at what line, and what page?

79 A. On the first page, line 33, starting with the phrase "it is".

"it is not unusual to incorporate a small quantity of an alkaline substance, such as silicate of soda, * * *"

Jumping to line 39, it mentions carbonate of lime or mag-

nesia being used for the same purpose. At line 43, he mentions carbonate of magnesia again. But in using these well-established substances, he finds various disadvantages, and these cause the patentee to search for other and more effective neutralizers, in the course of which he discovers urea. That is mentioned in line 59, the use of urea or carbamide as a neutralizer.

On line 61, he mentions:

"is an effectual neutralizer of impurities in nitro-compounds and absolutely prevents their decompositon."

These impurities are traces of acid that were left in the composition as the result of chemical reaction, and these traces of acid are capable of starting reaction which would be carried on further with ultimate destruction of powder and apparently the containers in which it was placed, and the patentee states in line 85 that he is able to attain complete neutralization as an absolute safeguard against the decomposition.

He mentions in line 94:

"The acids which have to be neutralized in such compounds are sulphuric, nitric and nitrous acids which may be found in faint traces in the adherent washwater."

and with the urea forms the nitrate or sulfate.

By Mr. Sheridan:

Q. 18. Would those be addition compounds?

A. Those would be addition compounds.

Q. 19. What if any analogy do you find in the disclosure of that patent to the disclosure of the patent in suit?

A. It is my opinion that as early as 1894 the ability of urea to combine in some manner with acid as such, resulting from decomposition, was known, and that in the patent in suit the patentees simply availed themselves of well-established knowledge and adapted it to their product.

Q. 20. The same property?

A. The same property specifically mentioned in the Schupphaus patent here, the formation of urea sulfate.

In the case of the patent in suit, urea sulfate would be formed if aluminum sulfate was the astringent compound used.

Q. 21. And that is the one used in the patent in suit?

A. I believe that is right.

Q. 22. In your opinion, would it be proper to refer to the urea as used in this Schupphaus patent as an acid inhibitor?

A. I believe so.

By Mr. Sheridan: The patent of Schupphaus is offered in evidence as Defendant's Exhibit F.

By the Court: It may be received.

(The document was received in evidence and marked DEFENDANT'S EXHIBIT F.)

(Note: Letter "E" skipped and not used in lettering Defendant's exhibits.)

By Mr. Sheridan:

Q. 23. There is obviously nothing of an antiperspirant character in that Schupphaus patent?

A. Obviously there is not. However, I believe there is a principle there that points to the ability of urea to bind acid and render it inactive which might find application in other fields, such, for example, as in the field of antiperspirants.

Q. 24. Now, if you will, direct your attention to the
82 patent to Missbach, 2,069,711, of February 2, 1937, the application filed April 10, 1936, that is a divisional application, and state if you have read and understand the disclosure of that patent.

A. I have read the patent, and believe I understand the disclosure, which covers the use of an acid inhibitor of the type mentioned in the patent to prevent the corrosion caused by carbon tetrachloride or other halogenated solvents.

By the Court:

Q. 25. What kind of solvents?

A. Halogenated solvents.

Q. 26. That means what?

A. There is a family of elements, of which chlorine is a member, chlorine, bromine, iodine,—they are collectively called halogens,—and a solvent containing one of those elements in its chemical structure would be a halogenated solvent.

In the disclosure of this patent, the Patentee attempted to develop some sort of acid inhibiting substance which would not only stabilize the halogenated solvent, as far as distillation was concerned, but also in storage; and also to prevent the destruction of a fabric when such a
83 halogenated solvent was used in the dry cleaning of clothes.

During distillation ordinarily halogenated solvents of this type will break down and form some corrosive by-product which, if allowed to remain in the material, can corrode equipment, the containers in which it is shipped, and ultimately, if used in the dry-cleaning process, can tenderize fabric by destroying it.

The Patentee attempted to overcome these drawbacks by the use of a stable acid inhibitor; and he mentions on line 53:

"a group of compounds which can be considered as derived from urea, termed ureides."

Ureides are a family of substances that will have this property of preventing the corrosion resulting from some of these ingredients present in the halogenated solvent.

By Mr. Sheridan:

Q. 27. Does he mention at all the possible use of urea in this particular patent?

A. On page 2, line 1, the sentence starts:

"Amides of carbonic acid, normal and acid, as carbamide (urea) * *."

Q. 28. And the specific halogenated compound he 84 refers to is largely carbon tetrachloride, is it not?

A. That is true, although he does not limit himself. He takes in, apparently, the entire family of halogenated solvents.

Q. 29. Carbon tetrachloride has several uses, does it not, industrially?

A. Yes. It has been used in the dry-cleaning operation. It is probably used to a larger extent in other industries; in fire extinguishers, for example.

Q. 30. But he here specifically refers to its use in dry cleaning clothes, does he not? And I refer to line 38, Claim 1, on the first page.

A. That is right. He describes it as:

"an inhibitor in carbon tetrachloride to be used in dry cleaning clothes must not deleteriously affect fabrics to be cleaned or alter the color thereof."

Q. 31. Does he state how he thinks urea functions in this patented compound?

A. Yes, he does. On page 2, line 18, he states:

"Firstly, they neutralize or remove any acid or acidic substances present; secondly, they retard the production of acid; * *"

Q. 32. Is there any analogy between the application or use of the urea with the carbon tetrachloride in this
85 Missbach patent and its use in the patent in suit, in your opinion?

A. I believe there is. It teaches the same thing that the first patent we discussed, the Schupphaus patent, did, namely, that urea has the faculty of neutralizing acids, and thereby inhibiting their corrosive effect.

By Mr. Sheridan: I offer copy of the Missbach patent in evidence as Defendant's Exhibit G.

By the Court: It may be received.

(The document was received in evidence and marked DEFENDANT'S EXHIBIT G.)

By Mr. Sheridan:

Q. 33. I show you patent to Shipp, 2,174,534, of October 3, 1939, application having been filed April 22, 1936, and ask you to state whether you have read and understand the disclosure of this patent.

A. I have read it, and I believe I understand the disclosure.

The object of the patent is to develop an agent which will inhibit the tendering effect of acid in a process used in producing certain types of textiles, processes generally referred to as parchmentizing. Cotton fabric in such a process is immersed into sulfuric acid, and allowed
86 to remain in contact for varying periods of time, depending upon the degree of parchmentizing expected, but the Patentee has found that in the use of such a process there is a great deal of tenderizing of the fabric, and oftentimes complete disintegration, and it is the object of this patent to develop a substance or a process, or both, that would prevent this tendering effect of the acid, and he refers to such substance as a cellulose degradation inhibitor. In line 22, column 2, he mentions that if a cotton fabric is immersed in 96 per cent sulfuric acid at room temperature, the fabric is disintegrated and destroyed.

By the Court:

Q. 34. What line is that?

A. Line 22.

Q. 35. What page?

A. Page 1, the second column, Sir.

By the Court: Oh, yes. Go ahead.

By the Witness:

A. (Continuing.) The fabric is disintegrated and destroyed:

"However, if as much as 25 parts by weight of urea is first added to each 100 parts of acid, then a fabric may be treated"

87 and so forth

"without being appreciably tendered."

By Mr. Sheridan:

Q. 36. Of course, the concentration in that patent disclosure would be far above anything that could be used with safety upon the human skin, is that correct?

A. Yes. In fact, even in all of his examples, the concentration of acid he uses is very substantially in excess of those we would probably come in contact with in normal usage of an antiperspirant. However, it does bring out the point that urea has the property of binding this acid in some manner that will prevent its corrosive action on the fabric.

Q. 37. Within some limit of time?

A. That is right.

Q. 38. And, in your opinion, the action or function of the urea in that patent is substantially the same function fundamentally as in the patent in suit?

A. It is, exactly, for, when aluminum sulfate hydrolyzes, and depending upon the degree of hydrolysis, if it ultimately hydrolyzes, we can get as much as three molecules of the sulfuric acid, and it is this acid that is the cause of fabric destruction or possible irritation. Alu-

88 minum hydroxide formed in such reaction is internally —we can take aluminum hydroxide internally. It is the acid that we are concerned with.

By Mr. Sheridan: The Shipp patent is offered in evidence as Defendant's Exhibit H.

By the Court: It will be admitted.

(The document was received in evidence and marked DEFENDANT'S EXHIBIT H.)

By Mr. Sheridan:

Q. 39. Please refer to the patent to Koch, 2,011,292, of August 13, 1935, and state if you have read and understand the disclosure of that patent.

A. I have read the patent and understand the dis-

closure. The Patentee attempts to prepare an aluminum acetate or formate so that it will have no detrimental effect on cloth, by the use of some substance that would prevent this effect. Starting with line 38, column 1, first page, he mentions that:

"The solutions of these products may be used with special advantage in the textile industry because they do not contain any substances which would have a detrimental effect when used, for instance, for impregnation purposes." He is referring to these solutions that he has developed with this particular substance, which happens to be
89 urea, and another example, thiourea.

He mentions in line 47, apparently Example 1:

"In 1000 parts of a solution of aluminum formate of specific gravity 1.09 there are dissolved 8 parts, i.e. 0.8 per cent, of urea."

Q. 40. Why, in your opinion, does the urea beneficiate the aluminum acetate or aluminum formate which he describes?

A. It is my opinion it serves exactly the same purpose there that it has served in the previous examples, namely, to prevent the same action on cloth.

Q. 41. Action by what?

A. By the acid ions resulting from the hydrolysis of the aluminum compound in question, forming an acetate.

Q. 42. Would water solutions of aluminum acetate and aluminum formate be acid in character?

A. Yes, they are.

Q. 43. Have you any idea why any such solution should be used in the textile industry?

A. I believe these solutions are used for mordanting the cloth. In the textile industry, when the textile is treated with a substance which will allow the dye to
90 be more permanently fixed, such substance is usually called a mordant. Sometimes the mordant is included directly in with the dye, but more often the cloth is first treated with the mordant. When the dye is then applied, it stays fixed and does not wash away.

I believe if the mordant contained an acidic substance which was capable of deteriorating cloth, it would be a definite drawback, and the Patentee apparently realized that in attempting to develop a form of aluminum acetate or aluminum formate with urea which would not have that detrimental effect.

Q. 44. In this compound of the Koch patent, in your opinion does the urea function as an acid inhibitor or a corrosion inhibitor?

A. I believe so.

Q. 45. Is that function, in your opinion, analogous to its property in the composition of the patent in suit?

A. I believe so.

Q. 46. Do aluminum formate and aluminum acetate solutions have antiperspirant properties?

A. Yes, they have some, according to our tests.

By Mr. Sheridan: I offer the patent to Koch in
91 evidence as Defendant's Exhibit I.

By the Court: It may be admitted.

(The document was received in evidence and marked DEFENDANT'S EXHIBIT I.)

By the Court: You are proceeding to another patent, are you, now?

By Mr. Sheridan: Yes. I have two more here.

By the Court: We will recess now until 2:00 o'clock.

(And Thereupon, a recess was taken until 2:00 o'clock p.m. of the same day, Thursday, December 20, 1945.)

92 M. G. de NAVARRE, called as a witness on behalf of the Defendant, having been previously duly sworn, resumed the stand and testified further as follows:

Direct Examination Continued by Mr. Sheridan.

Q. 47. Mr. de Navarre, is there any outstanding authority on the subject of urea, of which you have knowledge?

A. There is one book that was published on the subject in 1923. That is a book by Werner. I believe it was published in England. I think the title of it is "The Chemistry of Urea," or something like that.

Q. 48. And does that book, or do portions of that book, contain statements which are in line with your beliefs as to the properties or action of urea in these various patents, including the patent in suit that you have discussed in your testimony?

By Mr. Merriam: I would like to renew my objection to that kind of testimony, your Honor.

By the Court: Yes. Of course, this Court follows either the rule in the State courts or the rules that have been an-

nounced in Federal Court cases, whichever favors the
93 admissibility. The Illinois cases, I know, say that books are not admissible. I do not know whether any Federal Courts have passed on that question, and what they say about it. I have not inquired as to that.

By Mr. Sheridan: It is common practice to put textbooks and books of science in. What weight they may have is for the Court to decide, but I would like to urge this point, your Honor: that statements in a publication such as I am about to offer might not establish the truth of those statements, but they are part of the state of the art, just as much as a prior patent is, and if a publication makes the statement that urea is known to break down under the influence of heat at certain temperatures and release ammonia, maybe that is not true, but it is the state of the art, and the Patentee is presumed to have had knowledge of that and relied upon it. Maybe he was in error in relying upon it, but it pointed the way to him, and therefore was part of the state of the art.

By Mr. Merriam: I have no objection to the admis-
94 sion of the document. What I object to is it being received as proof of what it contains. If there is a statement in the literature that says urea breaks down at a certain temperature, then the Patentee is presumed to have known it said that, and it may or may not have been invention to do something of that kind, but it does not necessarily prove it is true.

By Mr. Sheridan: I think your own witness has testified that is the case.

By Mr. Merriam: I am not trying to argue whether that is true or not. I am just taking your simile. Urea does break down under temperature, we all admit that, but here is a man supposed to be an expert in this field. Why can't he testify of his own knowledge?

By Mr. Sheridan: He has.

By the Court: I do not think he should be allowed to testify to what the book says.

By Mr. Sheridan: I am not asking him to, your Honor. I am just asking him to point to authority for his statements, some corroboration, something in the state of the art which corroborates his statements. Objection to its
95 admissibility or weight or credence is something for your Honor to pass on.

By the Court: Do I understand, Mr. Merriam, that you are not objecting to the introduction of books showing that

this was known to the art, but are objecting to the witness testifying—

By Mr. Merriam: That that reinforces his belief in the thing, that the thing is true.

By Mr. Sheridan: I did not say "reinforce." I said that he found corroboration in.

By Mr. Merriam: I think he should say what he knows, not what some book states.

By the Court: If he wants to introduce the book as showing the state of the art, you say that would be admissible?

By Mr. Merriam: That is admissible.

By Mr. Sheridan: That is virtually all.

By Mr. Merriam: But not as proving the facts stated therein.

By Mr. Sheridan: I am heartily in agreement with that, and that is all I am doing.

By the Court: All right.

By Mr. Sheridan: I do think I am allowed to ask him to point to some prior art or some statement in the pub-
96 lication which states a similar belief. Experts do it repeatedly. They have been questioned as to whether or not they could find any substantiation of their opinions and beliefs. It is common practice in these cases.

By Mr. Merriam: I think it is a mistaken practice.

By the Court: Yes, I think it is. I do not think they can point to some publication in corroboration of their opinion.

By Mr. Sheridan: Maybe it is inconsequential.

Read the last question.

(Last question read by the reporter.)

By the Court: Objection sustained.

By Mr. Sheridan: Read the previous question and answer.

(Previous question and answer read by the reporter.)

By Mr. Sheridan: I have only the negative of the title page of this book. Will it be agreeable to have some photostats made?

By Mr. Merriam: Whatever you want.

By Mr. Sheridan: I offer in evidence, as Defendant's Exhibit J, pages 22 to 48, inclusive, of "The Chemistry
97 of Urea," by Werner, just referred to by the witness.

By Mr. Merriam: Did you plead all of those?

By Mr. Sheridan: No, I did not. I am only treating it as part of the state of the art. I have a set for you here.

By Mr. Merriam: I have not seen some of these pages.

By Mr. Sheridan: I will have to amend that.

Pages 36 to 39, inclusive, have been omitted.

(The document was received in evidence and marked DEFENDANT'S EXHIBIT J.)

By Mr. Sheridan:

Q. 49. In the depositions previously taken on behalf of the Plaintiff in this cause, plaintiff Wallace testified that what I have been terming the early "Arrid," which was adopted and marketed from the midsummer of 1935 to the last of September, possibly, of '36, was made by first sulfonating meta para cresol with strong sulfuric acid, then the resultant product was subjected to the action of, or there was mixed with it, formaldehyde, which was described as producing a resultant condensate or resin, of an astringent character, and that this compound was ultimately
98 mixed with urea in solution, and within the neighborhood of 10 per cent aluminum sulfate in the compounding of the early "Arrid" which was placed on sale and sold. From your knowledge of chemistry and compounding of chemical substances, what would your opinion be as to the relative expense and inconvenience of use of such cresolic compound, as compared with aluminum sulfate?

A. I believe that the cost would be very much greater for the use of a cresol sulfonic formaldehyde condensate. In the first place, the reaction is difficult to control. In the second place, the cost of manufacturing operations would rapidly multiply the cost of the product. Whereas, in the case of urea, you have a compound that is cheap and readily available.

Q. 50. I am talking about aluminum sulfate.

A. I mean aluminum sulfate. It is cheap, readily available, and of uniform composition.

Q. 51. You were directed, were you not, Mr. de Navarre, to conduct certain tests and experiments in connection with your testimony in this proceeding?

A. Yes, sir.

99 Q. 52. Will you describe what those were, and what if anything was done by you in the carrying out of those instructions, or of that direction?

A. We did two sets of things. We attempted to establish the activity as an astringent or antiperspirant of a number of compounds, such as aluminum chloride, aluminum sulfate alone and in combination with urea, urea in varying amounts, of a cresol sulfonic acid condensed with formaldehyde, without urea and with varying amounts of

urea, along with some of the other chemical compounds that have been used in the past or suggested for use in the past as antiperspirants. The results of those tests showed that—

Q. 53. Before you get to the results, just go into detail as to what the tests were, if you will.

A. We made up our solutions with different amounts of these reagents, and used 1 c.c. of the solution, and added it to 5 c.c. of egg albumen. We noted the amount of precipitation that took place, the nature of the precipitate, and then, on the basis of using four plus signs for maximum precipitation, and a blank sign for no precipitation, we got varying degrees of precipitation for these products.

Q. 54. What was the reason for that experiment or test?

100 A. We wanted to determine, first of all, if these compounds that had been treated with urea, particularly the cresol formaldehyde sulfonic acid compound, retained its antiperspirant properties as denoted by this albumen precipitation test.

Q. 55. Just what was the purpose of the albumen precipitation tests? What are those used for?

A. It is believed that astringency, or antiperspirancy, in this case, is the result of several reactions. One of them is believed to be the precipitation of protein within the skin cells. The nearest protein that we could get that answered the purpose was albumen, and we used that throughout the tests.

Q. 56. May I ask if that is a recognized test for that purpose?

A. There is a slightly modified test used in the leather industry, they use powdered leather, powdered hide substance, I believe they call it, to determine the effect of tanning agencies, and they have much the same action as antiperspirant or astringent compounds. There is a lot to be desired from them. We envisioned a material that would tell us quickly and clearly whether we got any action there or not. The solution turned rapidly opaque if the sub-

101 stance precipitated any of the albumen, we could tell quite rapidly what we were looking for.

Q. 57. Would that be equivalent to protein?

A. That would be; because albumen is a protein.

Q. 58. All right. Continue.

A. We found that the use of varying amounts of urea with cresol sulfonic acid that had been reacted with formaldehyde precipitated the egg albumen in all concentrations

whether there was urea added to it or not, and we got just about the same amount of precipitation in all of those tests.

Q. 59. Will you just go into more detail with respect to the tests? If you will, give each one a number. I understand that you have applied an identifying number to each of those products, is that true?

A. That is right.

Q. 60. Then, if you will, list your experiments, and give a little more detail as to each one, and number it, and include the identifying number which you placed on your resultant product.

A. In the use of a cresol sulfonic acid condensate with urea, we availed ourselves of a commercial product called "Negatan", made by the Eli Lilly Co., of Indianapolis.

102 Negatan is a solution of such a cresol formaldehyde sulfonic acid derivative in a concentration of between 45 and 50 per cent.

We then made up several samples with the same amount of Negatan and varying amounts of urea.

Sample 150-B contained 12½ c.c. Negatan, 15 grams of urea, and water to make 25 c.c.

Sample 151-B contained the same amount of Negatan, 10 grams of urea, and was brought to 25 c.c.

Sample 152-B contained the same amount of Negatan, with 5 grams of urea, and was brought to 25 c.c.

Sample 153-B contained the same amount of Negatan, and 1 gram of urea, and was brought to 25 c.c.

Sample 154-B contained 25 c.c. of Negatan and 25 grams of urea. The pH was taken at that point, and 10 grams of aluminum sulfate, 18 H_2O, was added.

Sample 155-B contained 25 c.c. of Negatan and 15 grams of urea, was brought to 50 c.c. The pH was taken, and 12½ grams of aluminum sulfate, 18 H_2O, was added.

Those are the samples that were used and were subsequently tested also on whether they had any effect on cloth.

Q. 61. Are you sure about that 15 grams? It seems to

103 me we had some discussion, and decided it was 12½ grams of aluminum sulfate.

A. In the last sample?

Q. 62. The last one you specified.

A. That was 15 grams of urea and 12½ grams of aluminum sulfate. Did I misstate myself?

Q. 63. I think you did. Perhaps not.

What was your idea in using Negatan in those mixtures?

A. There was not enough time to do experimental work

to determine the procedure for making a product similar to the one originally made by Wallace, and we availed ourselves of a product that we knew was made by a reliable organization, and that appeared to have the same type of property, it was colloidal in nature, it contained formaldehyde as well as cresol sulfonic acid, had a low pH, and had protein precipitating properties.

By Mr. Merriam: I think he has gone far enough. I would like to move to strike the whole line of testimony about these tests. There is evidence in the record that Mr. Wallace made a certain cresol sulfonic acid resin, and the properties are not shown. This man said he did not
104 have time to make that up, but he got something on the market he thought maybe was like it. How could he tell what was like it, if he did not know the properties of the first one? I move the whole line of testimony about these tests be stricken.

By the Court: I have not heard Mr. Wallace's testimony on that subject.

By Mr. Sheridan: Mr. Wallace gave a very vague sketch of it. His recollection was surprisingly vague, but out of it came the fact, as I stated in my question to the witness, they sulfonated meta para cresol, and then condensed it by the addition of formaldehyde. That we were unable to do in the time available, and the difficulty of getting the constituents, so the witness took a ready-made product on the market, which, for the lack of specification of percentages, and so forth, that Wallace was unable to give, was the best approximation of what he was likely to have used. We want to demonstrate that product was buffered, protected by the urea, not to indicate, as the implication is by their testimony, that it is corrosive to fabrics. We are seeking to set up its prior use as anticipation.

105 By Mr. Merriam: Here is an ex parte test. They go out on the market and they buy something they did not make themselves, and they now come before your Honor and say they have a vague idea of what was in it.

By Mr. Sheridan: We do not say we have a vague idea.

By Mr. Merriam: You did not make it up. You have no right to say what was in it, unless you made it up yourself.

By the Court: Or analyzed it afterwards.

By Mr. Merriam: Or analyzed it afterwards. I do not know whether it is the same as Wallace had. Wallace says,

"I did such and such a thing, and it did certain things." Now, you say, "We made something like it, and it did not do those things."

By Mr. Sheridan: I think we are entitled to rely upon the reputation of a reputable chemical drug house, as to what is in their product.

By the Court: I do not know that you are. It would be hearsay.

By Mr. Merriam: The proportions would be extremely important.

106 By Mr. Sheridan: How do we know what the witness used in these fabric tests put in on behalf of Plaintiff? Did he analyze the "Arrid"?

By Mr. Merriam: It is Mr. Sheridan's job to ask him, if he had any doubt about it.

By Mr. Sheridan: I do not question his credibility.

By the Court: I am going to admit it, subject to the objection. I do not know what Mr. Wallace's testimony was. I will determine afterwards.

By Mr. Merriam: I was going on what this man said, that it was not the same as Wallace's.

By Mr. Sheridan: He did not say it was not the same. He said he was unable to produce Wallace's in the time that was available.

By Mr. Sheridan:

Q. 64. Will you continue with your answer? Maybe you would like the reporter to read back.

(Record read by the reporter.)

A. (Continuing.) That material was mixed with these varying amounts of urea as specified in the samples given by number just previously, and the albumen precipitation tests were then made from parts of the sample, and tensile strength tests were made on other parts of the sam-

107 ple.

By Mr. Sheridan:

Q. 65. Were these samples utilized for albumen precipitation tests?

A. They were.

Q. 66. Can you state, from the result of these tests, whether or not there was an antiperspirant effect inherent in those samples?

A. There was a very strong protein precipitating action, albumen precipitating action, in each and every one of the

samples, whether any of the urea had been added or not, every one precipitated completely.

Q. 67. So is it your opinion that negatan would function as an antiperspirant without urea?

A. Very much so. The directions of the manufacturer call your attention to the fact that it has a strong coagulating action on protein, and it does have a low pH, and that the material as is, is corrosive to fabrics, to be very careful in the use of it.

Q. 68. But you are satisfied, in your opinion, that that is the case?

A. I am.

Q. 69. Were any other tests or experiments conducted by you, or any other samples prepared for test?

108 A. We prepared one sample utilizing the principle laid down by Koch in his patent.

Q. 70. That is the patent here in evidence?

A. Yes. And that sample likewise precipitated protein, the albumen used in the test.

Q. 71. State what you used specifically in that test.

A. We used a solution of aluminum formate that had been brought to a specific gravity of 1.09, as outlined in the patent, and added to it 8 grams of urea.

Q. 72. Did you test that out for antiperspirancy?

A. Yes, I did, and it did seem to possess antiperspirant properties.

Q. 73. What was the result of your test?

A. We made two tests. In one test we used the precipitation of egg albumen, and that gave us a very copious and rapid precipitate.

The other test was made on myself, in which it showed some antiperspirant properties.

Q. 74. And has that been tested as to its effect on fabrics?

A. Part of that sample was sent out for test on fabric.

Q. 75. Was that neutral or basic aluminum formate?

A. That was basic aluminum formate.

109 Q. 76. Is that as astringent or as antiperspirant in its effect as neutralized aluminum formate?

A. I am not prepared to say. I do not know.

Q. 77. What is the difference between the neutral and the basic aluminum formate?

A. In the straight or neutral or normal aluminum formate, the three bonds of aluminum, or three valences of aluminum which are capable of reacting with formic

acid are satisfied. In the case of basic aluminum formate, one or two of those bonds may remain unsatisfied. In the case of the compound in use, one of these bonds was still unsatisfied. It contained two formate groups, and one basic group.

Q. 78. Which of the two, in theory, would be the more acid in its admixture with formic acid?

A. Probably the straight formate, the normal formate.

Q. 79. The patent to Koch does not specify basic formate, does it?

A. I think it simply reads "aluminum formate". Aluminum formate.

Q. 80. Although it does state, does it not, at the very outset, that stable solutions may be obtained by adding the solutions of neutral or basic aluminum acetate or formate?

110 A. That is right. I just noticed that in the patent.

By Mr. Sheridan: I will state to the Court that samples of these compositions that the witness made up were submitted to the testing laboratory for fabric tests, and I should like to interrupt this witness's testimony to put on the man who made the fabric tests, if that is agreeable to opposing counsel.

By Mr. Merriam: There is no objection to the interruption. The same objection to the tests.

By the Court: Very well.

(Witness de Navarre temporarily withdrawn. Direct examination continued, beginning on page 123.)

111 J. A. NARY, called as a witness on behalf of the Defendant, having been first duly sworn, testified as follows:

Direct Examination by Mr. Sheridan.

Q. 1. Will you give your name, age, residence, and occupation?

A. J. A. Nary; Manager, United States Testing Company, 325 West Huron Street.

Q. 2. Your age?

A. Age forty-five.

Q. 3. Are you a chemist or physicist by vocation, Mr. Nary?

A. Yes.

Q. 4. What is the general nature of your duties with the U. S. Testing Laboratory?

A. It is general supervision of the tests that we are equipped to handle at this branch.

Q. 5. Does that include fabric tests?

A. Especially fabric tests.

Q. 6. You are experienced in conducting such tests?

A. That is true.

Q. 7. It is a fact, is it not, that Mr. de Navarre, who has been testifying here, brought to you certain sam-
112 ples, preparations, which he asked you to test upon fabrics?

A. That is right.

Q. 8. And those were identified by numbers of some sort or other?

A. That is right.

Q. 9. Do you have those numbers?

A. I have.

Q. 10. He also brought to you cloth to be used in those tests, did he not?

A. Yes.

Q. 11. Can you state generally the character of that cloth?

A. Yes. I have a sample here.

Q. 12. It is cotton cloth, is it not?

A. That is right, cotton cloth.

Q. 13. Will you produce those samples?

A. (Witness producing same.) This is one of the samples. I have it marked on there, because the application of the antiperspirant has to be applied in a certain way.

Q. 14. This sample you have handed me is unmarked, isn't it? You mean the lines on it?

A. The lines on it, that is right.

113 Q. 15. Those are applied by you?

A. That is right. It was a plain cotton fabric when we received it.

Q. 16. But this is a plain sample?

A. An untreated sample.

By Mr. Sheridan: I offer that in evidence as Defendant's Exhibit K.

By the Court: It may be admitted.

(The sample was received in evidence and marked DEFENDANT'S EXHIBIT K.)

By Mr. Sheridan:

Q. 17. Will you state just what you did with the samples which Mr. De Navarre submitted to you, describing any results which you noted as a result of your test?

A. Would you want me to read directly from the report we are issuing on this?

Q. 18. Is that report made by you?

A. Yes.

Q. 19. And it represents accurately the tests you made and the results you recorded?

A. That is right, and gives the procedure, too, that was followed.

Q. 20. If that is more convenient to you, proceed.

114 A. "To determine the tenderizing effect, if any, on cotton fabrics, the above solutions were applied as follows." The "above solutions" are nine samples of astringent composition which were submitted by Mr. de Navarre.

"Several yards of fabric were cut in strips 6 inches wide and 21 inches long across the goods." That is one of the samples that I brought with me. "A 1-inch strip was marked off lengthwise on these strips for the application of these solutions."

On that sample there, you will notice there is a strip across the center, that 1-inch strip, that was used to apply the solution.

"To the 1-inch by 21-inch strip was applied approximately 2½ cc. of each solution." Two of those strips were treated for each astringent.

"As controls, two strips were not treated. Tests on these strips would give the actual strength of the cotton cloth itself. The 18 treated pieces and two controls were aged for 18 hours by suspending in an atmosphere of 78 degrees F. and 65 per cent relative humidity.

"At the end of this period all strips including controls were pressed with an electric iron with a controlled
115 temperature range of 265 degrees to 305 degrees F. for 10 seconds.

"After pressing, the strips were returned to the above atmosphere for a period of three hours.

"Before the last period the strips were cut into 6-inch by 4-inch pieces", and one of them is marked out in red, the size of the strip is marked out in red there.

Q. 21. On Defendant's Exhibit K? You are referring to Defendant's Exhibit K?

A. That is right, the area marked in red, is one of the 6-inch by 4-inch pieces that were cut out. "and a line drawn along one thread about 1½ inches from the edge.

"After the final 3-hour aging, samples were broken in a Scott testing machine. Speed of lower jaw was 12 inches per minute and initial distance between jaws was 3 inches. One inch jaws were used.

"The results of the strength tests and the loss or gain due to the application of the various solutions follows:"

Q. 22. Mr. Nary, if you will, confine your testimony to the results of tests of samples 150-B to 155-B, inclusive, and 160-B. You have those seven, do you not, 116 there?

A. No. I have all those you mention except 160-B.

Q. 23. You do not have that?

A. No. I have a sample that has been treated, but no strength test was made on it.

Q. 24. But you have the sample?

A. I have a treated sample here.

Q. 25. Then confine your testimony, if you will, on the strength test to 150-B to 155-B, inclusive.

A. And the control, of course?

Q. 26. Yes.

A. The control sample, the strength, an average of ten breaks at ten tests is 58.2 pounds.

Sample 150-B, the strength was 62.3 pounds, or a gain in strength of 7.0 per cent, above the control.

Sample 151-B, the strength was 58.1 pounds, no gain or loss on that sample.

Sample 152-B, the strength was 43 pounds, or a loss in strength of 26.1 per cent.

Sample 153-B, the strength was 6.3 pounds, or a loss of 89.2 per cent.

Sample 154-B, the strength was 60.8 pounds, or a gain of 4.5 per gain.

Sample 155-B, the strength was 51.3 pounds, or a 117 loss in strength of 11.9 per cent.

I might mention that these differences in strength that are given in this report are a gain or a loss over the control or original sample, which, of course, was not treated, while all of these other samples were treated with the different astringents.

Q. 27. In this 160-B sample, you did apply some of that to a cloth strip, did you not?

A. I did.

Q. 28. What did you do with it after that, if anything?
A. I have it here with me.
Q. 29. But no strength tests were made?
A. No strength tests were made.
Q. 30. May we have specimens from those tests, did you bring those with you?
A. Yes, I have all of those specimens with me.
Q. 31. Are they all marked in accord with the numbers you have given?
A. They are marked in groups of five, yes.
Q. 32. But they bear "150-B", and so forth?
A. That is true. They are all in sets of five.
Q. 33. That is, you made five tests for each sample of compound given you?
A. There are ten, two groups of five, and the 118 square pieces on the top are the 160, on which we have not made strength tests.
By Mr. Sheridan: Will it be agreeable to opposing counsel if I offer these as a batch in the envelope?
By Mr. Merriam: Certainly.
By Mr. Sheridan: The specimens of the fabric samples referred to by the witness are offered as one composite exhibit, Defendant's Exhibit L.
By Mr. Merriam: My objection is standing to this whole line of testimony, I assume?
By the Court: Yes.
(The fabric samples were received in evidence, and marked as a composite exhibit, DEFENDANT'S EXHIBIT L.)
By Mr. Sheridan: Direct examination closed.

Cross-Examination by Mr. Merriam.

Q. 34. On some of these samples, you said there was a gain of 4 per cent, I believe. Is that within the limits of your testing machine?
A. Within the limits?
Q. 35. Yes.
119 A. That machine has 100 pounds capacity, if that is what you mean.
Q. 36. No. You said you made ten tests to average 58.2?
A. That is right.
Q. 37. What was the deviation in arriving at that average, how high and how low did the individual tests go?

A. The individual tests?

Q. 38. Yes.

A. I do not remember. I did not bring them with me.

Q. 39. Was it plus or minus 5 per cent, within the group of samples?

A. I think so. I am not positive.

Q. 40. Haven't you had previous experience on cloth, enough to know?

A. That is right. We usually consider that a variation of 10 per cent between individual breaks is permissible.

By Mr. Merriam: That is all.

By Mr. Sheridan: I notice some of these samples do not appear to be marked, Mr. Nary. I would like to just run through these, and take out any samples that you have not testified about.

120 *Redirect Examination by Mr. Sheridan.*

Q. 41. These are not marked on the top. Will you just mark them? I would like to be sure they are all identified.

A. They are marked in groups of five. The individual ones are not marked.

Q. 42. I want you to mark them all.

A. It will take a few minutes.

Q. 43. All right. I will ask you, I notice on the six samples marked 160-B, three of them are marked "1 hour" and three are marked "16 hour." Do those represent the periods?

A. Those samples were given .8 cc. of the 160 solution.

Q. 44. 160-B?

A. The 160-B solution. And the "1 hour" indicates they were placed in an oven one hour, at a temperature of 80 degrees Centigrade.

The other samples, marked "16 hour," were placed in the same oven for sixteen hours at the same temperature.

Q. 45. 80 degrees Centigrade?

A. 80 degrees Centigrade.

121 By Mr. Sheridan: I do not need to delay the proceeding. You can take those to the table over here, and finish your numbering.

Recross Examination by Mr. Merriam.

Q. 46. I understood you to say first that these were at 78 degrees Fahrenheit, in your original testimony, that is all I remember of your saying. You say now they were tested at 80 degrees Centigrade?

A. That only applies to sample 160-B.

Q. 47. On which you made no test?

A. On which I made no strength test.

Q. 48. Why did you take 80 degrees Centigrade as your temperature?

A. Those were our instructions.

By Mr. Sheridan:

Q. 49. From Mr. de Navarre?

A. From Mr. de Navarre.

By Mr. Merriam: That is all.

(Witness excused.)

122 M. G. de NAVARRE, called as a witness on behalf of the Defendant, having been previously duly sworn, resumed the stand and testified further as follows:

Direct Examination (Continued) by Mr. Sheridan.

Q. 81. You have been present and listened to the testimony of Mr. Nary, have you not?

A. I have.

Q. 82. And you were the one who gave him the instructions for these tests, which he conducted?

A. That is correct.

Q. 83. Will you state why, with respect to Sample 160-B, no strength test was made?

A. There were two reasons for that, one of the reasons being that there was not enough time to complete the test as we would want to have it completed. The second reason being that we wanted to duplicate a test as had been outlined by Wallace in previous testimony, in which he used one, three, five, and seven-hour periods, using a like amount of sample as we had used here, maintaining at that temperature, and doing nothing to the fabric but observing it from its physical appearance, as to whether it had disintegrated or not.

123 Q. 84. That was in the Woolworth case?

A. Yes, sir.

Q. 85. Can you state what was applied to the samples? In other words, what was the constituency of sample 160-B, which was applied to these fabric samples?

A. That was the composition described by Koch, namely, containing basic aluminum formate brought to a specific gravity of 1.09, to which was added .8 grams per 1000 c.c. of urea.

Q. 86. Can you draw any conclusions from visual observation of these two sets of fabric treated as 160-B?

A. Just briefly checking the samples between the fingers, there appears to be no disintegration, although you cannot make an exact statement as to whether it may have lost a few per cent in tensile strength or not, but they do not disintegrate on pulling.

By Mr. Sheridan: I think I will back away from my original intention. I will offer these sets of samples separately.

By the Court: All right.

By Mr. Sheridan: The samples of fabric referred to by the witness, marked 160-B, are offered in evidence as Defendant's Exhibit M. I will make a present 124 of one of these to opposing counsel.

(The samples of fabric labeled "160-B," heretofore received as part of composite exhibit DEFENDANT'S EXHIBIT L, were thereupon received in evidence and marked DEFENDANT'S EXHIBIT M.)

By Mr. Sheridan: I offer 150-B as Defendant's Exhibit N.

(The samples of fabric labeled "150-B," heretofore received as part of composite exhibit DEFENDANT'S EXHIBIT L, were thereupon received in evidence and marked DEFENDANT'S EXHIBIT N.)

By Mr. Sheridan:

Q. 87. I call your attention to the samples of fabric 150-B, and will ask you again to state the constituency of the composition which was 150-B?

A. 150-B consisted of 12½ c.c. of Negatan, 15 grams of urea, and the mixture brought to 25 c.c.

Q. 88. Will you state, similarly, with respect to your specimen 151-B, which was utilized in these fabric tests?

A. That contained the same amount of Negatan as did

the 150-B, but only 10 grams of urea, one-third less 125 of urea.

Q. 89. Continue, if you will, to the same effect with samples 162-B to 155-B, inclusive.

A. 152-B was the same as the first, except there was 5 grams of urea.

153-B the same as the first.

Q. 90. That is, when you say "the first," you mean 150-B?

A. 150-B, that is right. But this one, 153-B, contained only 1 gram of urea.

Sample 154-B contained 25 c.c. of Negatan, 25 grams of urea, brought to 50 c.c., and 10 grams of aluminum sulfate was added.

Sample 155-B contained 25 c.c. of Negatan, 15 grams of urea, and 12½ grams of aluminum sulfate.

By Mr. Sheridan: I will offer in evidence the fabric samples numbered 151-B as Defendant's Exhibit O.

(The samples of fabric labeled "151-B," heretofore received as part of composite exhibit Defendant's Exhibit L, were thereupon received in evidence and marked DEFENDANT'S EXHIBIT O.)

By Mr. Sheridan: I offer in evidence samples num-
126 bered 152-B as Defendant's Exhibit P.

(The samples of fabric labeled "152-B," heretofore received as part of composite exhibit Defendant's Exhibit L, were thereupon received in evidence and marked DEFENDANT'S EXHIBIT P.)

By Mr. Sheridan: I offer in evidence samples marked 153-B as Defendant's Exhibit Q.

(The samples of fabric labeled "153-B," heretofore received as part of composite exhibit Defendant's Exhibit L, were thereupon received in evidence and marked DEFENDANT'S EXHIBIT Q.)

By Mr. Sheridan: I offer in evidence the samples marked 154-B as Defendant's Exhibit R.

(The samples of fabric labeled "154-B," heretofore received as part of composite exhibit Defendant's Exhibit L, were thereupon received in evidence and marked DEFENDANT'S EXHIBIT R.)

By Mr. Sheridan: And the samples marked 155-B, as Defendant's Exhibit S.

(The samples of fabric labeled "155-B," heretofore
127 received as part of composite exhibit Defendant's

Exhibit L, were thereupon received in evidence and marked DEFENDANT'S EXHIBIT S.)

By the Court: They may be admitted.

By Mr. Sheridan: Direct examination closed.

Cross-Examination by Mr. Merriam.

Q. 91. Mr. de Navarre, you said that you took these heating periods from Wallace, in the Wallace against Woolworth suit. Where in that case did you find where Wallace gave a heating period for testing cloth?

A. That is where I took it, from the record.

Q. 92. If you will look at page 20, I think you will find those are the tests you are referring to—24?

A. No, that is not the one.

Q. 93. On 24, it is Dr. Killian, isn't it?

A. I want to check back, if I can find the right page.

By Mr. Sheridan: Will counsel concede that Dr. Killian was a witness on behalf of Wallace, in the Wallace *vs* Woolworth suit?

By Mr. Merriam: Certainly, if you will concede that 128 the tests were criticized by the Defendant as being not a proper temperature.

By the Witness:

A. I believe I have found the test here. The test was made by Killian. I am in error. On page 17.

By Mr. Merriam:

Q. 94. And did you read the rest of the record, to find out whether the temperatures used were criticized by the Woolworth Company lawyers?

A. I did not.

Q. 95. The only reason you picked 80 degrees Centigrade was because of Dr. Killian's test?

A. We wanted to duplicate the test that was given there.

Q. 96. On these samples, 150-B to 155-B, that you have discussed—here is 150-B. Do you regard that as a stable commercial material for an antiperspirant?

A. I think it is impossible to tell from the appearance of the fabric whether the product that was used would make a satisfactory product or not. Are you referring to the discoloration of the fabric?

Q. 97. I am referring to the discoloration.

A. I believe the discoloration of the fabric may have been due to the brush with which it was applied. I am not in a position to say exactly. I believe Mr. Nary can give you that information.

129 Q. 98. At any rate, a product which produces such a discoloration would not be commercially satisfactory, would it, if it were due to the product itself?

A. If it were due to the product itself, it may not be.

Q. 99. Don't you know?

A. The color could be covered very satisfactorily with a whitening pigment and brought up to an appearance that would not be objectionable.

Q. 100. Do you know how much urea Dr. Wallace used in his cresol sulfonic acid resin material?

A. I do not.

Q. 101. So that you do not know whether the amount he used might have been a good deal less than he used in any sample?

A. It may have been. That is why we covered the range.

Q. 102. What was the smallest proportion of urea that you used?

A. We used 1 gram in Sample 153-B.

Q. 103. One gram to what?

A. To 12½ c.c. of Negatan in a 25 c.c. total volume.

Q. 104. Why didn't you test these in the same way that Dr. Wallace did in his testimony for the presence
130 of urea?

A. We chose this particular test because we wanted to get the effect with ironing. We feel that that is a more critical test of the rotting effect of an antiperspirant on cloth.

Q. 105. You have not repeated his tests?

A. I do not know what his tests were.

Q. 106. During your testimony from time to time, you have spoken of hydrolysis, and you have also spoken of ionization. Those two things are quite distinct, are they not?

A. A product must hydrolyze to produce ions.

Q. 107. Chemically, do you think that hydrolysis and ionization are the same thing?

A. I believe they are usually written together.

Q. 108. Did you use them to mean the same thing in your testimony?

A. I do not recall how I used them in the particular testimony.

Q. 109. But you do not intend to distinguish between them now?

A. Not particularly.

Q. 110. Isn't there a use of the word "hydrolysis" that means decomposition as distinguished from ionization?

131 A. There may be.

Q. 111. Don't you know?

A. I do not recall of one immediately. Some things hydrolyze, and do not necessarily decompose.

Q. 112. When aluminum acetate reacts with water to form basic aluminum acetate, is that hydrolysis or ionization?

A. I think it is a combination of both. You cannot get one without the other. I think they are tied together.

Q. 113. What are the products of the decomposition to the basic aluminum formate?

A. I do not get that question.

Q. 114. What are the products of the decomposition which leads to the formation of basic aluminum formate?

A. From what?

Q. 115. From the ordinary aluminum formate and water.

A. I believe ordinarily aluminum formate, as such, does not apparently hydrolyze over to the basic salt except under basic conditions. It can hydrolyze to the monobasic derivative, or the diabasic derivative.

Q. 116. I asked you what the products were of the hydrolysis when that occurs.

132 A. Of the formate?

Q. 117. Yes.

A. You will get some aluminum ions, and you will get some formate ions, and you can get some basic ions. I think you can get a complex list of ions.

Q. 118. Don't you also get an insoluble product?

A. You may get an insoluble product.

Q. 119. Doesn't Koch talk about getting an insoluble product?

A. Koch does not mention an insoluble product, that I can see.

Q. 120. Why has he added urea to the aluminum acetate and the aluminum formate?

A. I believe he adds it to the product there for the

purpose of getting, as he claims here, substances which would not have a detrimental effect when used, for instance, for impregnation. He wants a substance that does not have that detrimental effect.

Q. 121. I call your attention to Mr. Koch's patent, on page 1, column 1, line 28:

"The solutions thus obtained are stable in the different merchantable concentrations for an unlimited time. They may be evaporated to dryness without decomposition of the aluminum salts so that solid water soluble aluminum acetate or formate may be obtained."

133 What decomposition is he talking about?

A. He may be talking about the formation of an insoluble formate.

Q. 122. What else would he be talking about?

A. Or acetate. He mentions both in the patent.

Q. 123. Is there anything else he could be talking about there?

A. That is all that I can see at the moment.

Q. 124. If he got an insoluble basic aluminum formate, would that insoluble material be ionized?

A. If it was insoluble, it probably would not ionize; but things are relatively insoluble.

Q. 125. The part that was insoluble would not be ionized, would it?

A. As I mentioned, all insoluble things are relatively insoluble.

Q. 126. What you mean is, part of them go into solution, and part of them do not?

A. Part of the insoluble precipitate may ionize, because there is no strictly insoluble substance.

Q. 127. Let us just take any substance. You pick one. Just give me any salt you want that is relatively insoluble.

A. Let us assume iron, for example. We would 134 not consider iron to be soluble.

Q. 128. Iron is not a salt, is it?

A. Iron is not a salt.

Q. 129. Take the basic aluminum formate. How much of that is soluble?

A. I do not know, offhand.

Q. 130. Let us assume 1 per cent is. Would that be fair?

A. I do not know.

Q. 131. It may be high, it may be low, but it is somewhere down there?

A. That is right.

Q. 132. If you have a particular solution of 1 per cent of what is not dissolved that goes into solution, 99 per cent is left?

A. Correct.

Q. 133. Is the 99 per cent left behind ionized, or is the 1 per cent ionized?

A. The 1 per cent that would go into solution would be ionized.

Q. 134. And the 99 per cent would not?

A. That is right.

Q. 135. I also refer you to lines 37 to 42 of Koch, where he says:

135 "The solutions of these products may be used with special advantage in the textile industry because they do not contain any substances which would have a detrimental effect when used, for instance, for impregnation purposes."

That statement is correct, is it not?

A. Yes, sir.

Q. 136. And that is true if he is referring to the aluminum acetate by itself, is it not?

A. I believe he is referring to the material—

Q. 137. Just answer the question. Is it true if he is merely referring to aluminum acetate? I am making the assumption he is referring to that.

A. I am trying to determine whether he is.

Q. 138. I say, if you make that assumption, is the statement correct?

A. I do not think I know what you are getting at.

Q. 139. Is an aluminum acetate detrimental to fabrics in the textile industry?

A. Yes, sir.

Q. 140. In what way?

A. It will cause tenderizing.

Q. 141. When used in the proportions that he talks about?

A. I have used it in a proportion of 2 per cent,
136 and it had as much as 35 per cent loss of tensile strength in cloth.

Q. 142. Did you do that personally?

A. I made the solution, and the tests were made.

Q. 143. You did not do that personally?

A. I did not make the tearing strength test personally.

Q. 144. Do you think that urea would stop that tenderizing action?

A. I believe it would.

Q. 145. Have you ever tested it?

A. I have not tried it with aluminum acetate.

Q. 146. Have you tried it with aluminum formate?

A. 160-B contained aluminum formate and urea.

Q. 147. That was basic aluminum formate, was it not?

A. I do not believe he distinguishes between basic and non-basic.

Q. 148. Does basic aluminum formate, when used on cloth, cause tenderizing?

A. I could not answer that question, because I have not tried it.

Q. 149. And you do not know what the effect of urea would be on a solution of basic aluminum formate?

A. I would assume it would have the same effect
137 on aluminum formate as it would have on any other aluminum salt.

Q. 150. I asked you if you knew.

A. I do not know for a fact, except what I know from 160-B.

Q. 151. You had no control on that, there was no control without the urea, was there?

A. No, sir.

Q. 152. You have never tested the acetate with the urea?

A. No, sir.

Q. 153. What happens when you decompose a solution of aluminum acetate into its ultimate acid and base? What acid is generated?

A. Acetic acid.

Q. 154. That is just plain vinegar?

A. That is right, it would be vinegar in 5 per cent concentration.

Q. 155. Do you consider vinegar corrosive to clothing?

A. I have not tested it, so I cannot say.

Q. 156. Do you think the presence of aluminum hydroxide with the vinegar would have any effect on its corrosiveness on clothing?

A. I think it would.

Q. 157. Would it reduce it, or increase it?

138 A. It should reduce it.

Q. 158. Much, or little?

A. Depending on how much is used.

Q. 159. You get equal quantities, because it is produced by the decomposition of aluminum acetate?

A. I do not think you would get equal quantities.

Q. 160. I mean equal reacting quantities?

A. Equivalent quantities?

Q. 161. Yes.

A. I should think so.

Q. 162. Think what?

A. That the product would be more equally neutralized.

Q. 163. Than what? Than if you use vinegar alone?

A. Than if you use vinegar alone.

By the Court: We will take a short recess.

(A short recess was thereupon taken.)

By Mr. Merriam:

Q. 164. I would like to go ahead with the Koch patent. As I understood your direct testimony, you felt that the use of urea in Koch was directly analogous to the use Wallace made of it in the patent in suit?

A. That is correct.

Q. 165. I wish you would start with a solution of 139 aluminum acetate, and let us just follow through without the urea, then we will put the urea in, and see what happens. The first thing that occurs is that the aluminum acetate ionizes in the water, doesn't it?

A. That is correct.

Q. 166. It forms aluminum ions and acetate ions?

A. That is right.

Q. 167. In the meantime, the water has formed hydrogen ions and OH ions?

A. That is correct.

Q. 168. Then I presume there is a tendency of the aluminum ions and the acetate ions, and some of the OH ions, to unite to form this basic aluminum acetate he is talking about, is that correct?

A. I believe so.

Q. 169. And some of that is precipitated?

A. Yes, sir.

Q. 170. And what is left in solution?

A. There is some aluminum acetate left in solution.

Q. 171. And what else?

A. Maybe some acetic acid.

Q. 172. Free acetic acid left in the solution?

A. Yes.

Q. 173. If you add urea to that solution with the 140 free acetic acid present, what happens?

A. You will probably get some urea acetate, among other ingredients.

Q. 174. Will that tend to promote or to stop the hydrolysis?

A. Of the aluminum acetate into the sub-acetate?

Q. 175. Correct.

A. I do not know. It may, it may not. I think it is a matter of conditions.

Q. 176. So you cannot tell what would happen?

A. No, sir.

Q. 177. You do not know whether Koch works?

A. I know that Koch works, because I made the mixture.

Q. 178. And you found you did not get any precipitation?

A. I did not use the acetate. I used the formate.

Q. 179. I asked you for the acetate.

A. I could not testify as to that, because I did not use the acetate.

Q. 180. With the formate, would it prevent precipitation?

A. We got no precipitation with the formate.

Q. 181. In what length of time?

A. Twenty-four hours.

141 Q. 182. Do you think that is a fair test as to time?

A. No, I think you should really have it set for six months, as far as testing is concerned.

Q. 183. I may be wrong, but I had an impression from your book, that you said that aluminum acetate could not be properly stabilized except by borax. Am I correct?

A. At that time, that was the extent of the knowledge I had on the subject?

Q. 184. That was in 1941, wasn't it, that you wrote that?

A. The book was published, I believe, in 1941. The manuscript was delivered approximately one year earlier.

Q. 185. And the Koch patent issued in 1935?

A. I was not aware of the Koch patent at the time.

Q. 186. The Koch patent had not taught you anything in 1941 about the use of urea in stabilizing aluminum acetate, had it?

A. At that time, we had not been interested in checking into all of the things that may affect the solubility or

insolubility of materials. We simply reported the things we knew about, without checking through the literature.

We made some check of the literature, as far as some
142 patents were concerned, those that were immediately available.

Q. 187. Let us go back to our aluminum acetate in solution, and its form of precipitate, a basic aluminum acetate and some free acetic acid. Isn't it a fact that hydrolysis will go to completion if you remove one of the products of hydrolysis which is necessary for the reversible reaction?

A. The reaction continues to go on until it reaches completion.

Q. 188. If you remove one of the products of decomposition?

A. That is right.

Q. 189. Acetic acid is one of the products of that hydrolysis, isn't it?

A. Yes.

Q. 190. If you remove it, isn't it a chemical law that you tend to cause a reaction to go to completion?

A. I do not believe you remove it with urea. I believe you hold it there, but you combine it. The urea forms a combination with the acetate, forming a urea acetate.

Q. 191. Is that composition ionized?

A. At higher temperatures I believe it will ionize.

Q. 192. I am talking about room temperatures.

143 A. I do not believe it does, to a very large extent.

Q. 193. Isn't the presence of the acid ion necessary to cause that reaction to go to reversal?

A. I think when you have a complex mixture like that, it is impossible to predict exactly what will happen. The peculiarities of urea are such that the literature is not certain what happens with many straight compounds, let alone those that go into reversal.

Q. 194. Yet you expect Wallace to know?

A. I do not believe Wallace in his patent claimed to know.

Q. 195. Do you think he should have known more about it then than you know now?

By Mr. Sheridan: I object to that, your Honor.

By the Court: That objection will be sustained.

By Mr. Merriam: That may be argumentative, your Honor.

By Mr. Merriam:

Q. 196. You stated that acetic acid will react with urea to form an addition compound?

A. It may. I think it should, under certain conditions. It will under certain conditions.

Q. 197. Do you know whether it does or not?

A. I cannot establish that for a fact.

144 Q. 198. Do you know what the pH of a 10 per cent solution of aluminum acetate is?

A. Offhand I do not know, no, sir.

Q. 199. Is it higher or lower than that of aluminum chloride of the same concentration?

A. It would be higher. That is, it would be more basic.

Q. 200. If aluminum chloride was 2.7, as I think was testified, the aluminum acetate might be up in the 3's, or nearer 4?

A. Probably.

Q. 201. Then if urea reacted with acetic acid to form an addition compound, would you or would you not expect it to react with aluminum chloride to form an addition compound?

A. I believe I would expect it to react that way.

Q. 202. And if it formed an addition compound with aluminum chloride, what would happen to the pH of the solution?

A. Do you mean if it would react with the aluminum chloride or with the products of hydrolysis of aluminum chloride?

Q. 203. Either one. You state what you think it reacts with, and then tell me.

145 A. I think it reacts with both, but I think the pH would drop on the first small addition of urea. As the amount of urea was added to, it would go up.

By the Court:

Q. 204. Will you repeat that?

A. On the first small addition of urea, the pH would drop. Then, as the amount of urea was increased, the pH would keep on going up until you stopped adding urea.

By Mr. Merriam:

Q. 205. Why would it drop?

A. I do not know why, but I know it does.

Q. 206. You mean you tested it?

A. Yes, sir.

Q. 207. With what did you test it?

A. With aluminum chloride.

Q. 208. What concentration of solution?

A. 25 per cent.

Q. 209. At what temperature?

A. Room-temperature.

Q. 210. What was the original pH of the solution?

A. At the moment I do not recall, but if we can accept what was put into the record, at 2.7, the pH would drop about 1 to 15 units.

146 Q. 211. You mean, one-tenth of a unit?

A. I am sorry. You are right. .1 to .15 units. I may have that with me here.

Q. 212. I wish you would look.

A. In an aluminum chloride solution, the pH of which was 1.87. That was metered aluminum chloride.

Q. 213. You have produced an aluminum chloride solution with a pH of 1.87?

A. That is the reading I have here.

Q. 214. What kind of pH meter was that?

A. A Beckman pH meter.

Q. 215. Used under what conditions?

A. Room conditions, standard conditions.

Q. 216. Had it been calibrated recently?

A. It had new batteries, new amplifying tubes, within the last few months.

Q. 217. Have you ever seen any pH of aluminum chloride in the literature to confirm such a low pH?

A. At the moment I do not recall, and these readings here all fall in line.

Q. 218. What happened when you added urea?

A. When you added 4 grams of urea, the pH dropped from 1.87 to 1.7.

Q. 219. Can you explain why that should be?

147 A. I cannot explain it at the moment. I have not tried to explain it.

Q. 220. Would you expect that 1.7 solution to be more or less corrosive to cloth than the 1.87?

A. It may or may not be. I do not believe corrosiveness to cloth is a function of pH.

Q. 221. Could you tell from a knowledge of what readings you have there how it would operate on cloth?

A. I can tell from the next addition. When we added 8 grams of urea, the pH came up to 1.8, it having originally been 1.87 before the addition of urea, and tests we

had made of that cloth showed a 6.6 per cent tensile strength loss.

Q. 222. Then what happened? How much more did you add?

A. We kept on going up until we added 16 grams of urea.

Q. 223. By that time where was the pH?

A. The pH came up to 2.0.

Q. 224. You stated at the beginning of your testimony that urea ionized when it was added to water?

A. I do not believe I said that.

Q. 225. I understood you to. But if you want to state now what is correct, I wish you would.

A. I believe urea will ionize to a very slight extent
148 at room temperature.

Q. 226. In what way is it ionized? What are the ions that result?

A. I think you will get some ammonium ions coming from that, and then a complexity of ions; but the degree of ionization is very, very faint.

Q. 227. There is the formula for urea. Will you show the Court with this chalk how you would get ammonia ions out of that?

A. It is very obvious. Each one of these NH_2 groups here would go off with some of the hydrogen from some of the ionized water, and form some ammonia. As I mentioned before—

Q. 228. Now, just a minute. The ion NH_2, how is that going to be charged, positively or negatively?

A. Positively, after it is in the form of ammonia.

Q. 229. And that will add on a positively charged hydrogen ion?

A. I do not understand the mechanism of the reaction, but it is obvious it must get it from the ionized water.

Q. 230. I am asking you if you would get it from a positively charged hydrogen ion.

A. It must.

Q. 231. Isn't it a fact that positively charged
149 articles repel each other.

A. They may repel each other, but in this solution I do not believe that is true, I believe they can hook on.

Q. 232. Do you know of any other case where that occurs?

A. I do not recall of any at the moment. It is obvious that the hydrogen must come from some source that is in

the water. The only other source of hydrogen is the second amino group, and the hydrogen present in the water.

Q. 233. What is the pH of a solution of urea?

A. A 15 per cent solution of urea that we have checked had a pH, as I recall it, of somewhere between 7 and 8. I do not recall the exact figure.

Q. 234. Had you tested that solution to be sure it was free from ammonia?

A. The solution had been freshly made up.

Q. 235. Had the material from which you made the solution been tested for purity?

A. The material is sold as a pure product.

Q. 236. Had it been tested by you for purity?

A. We did not test for purity.

Q. 237. Isn't it a fact that pure urea is known to have an approximate pH of 7.0?

A. Pure urea is supposed to be practically neutral;
150 I think the literature indicated it was supposed to be neutral, but the literature that was reported at that time was able to use only the colorimetric method, and those are in pretty sharp error.

Q. 238. When urea is put in a water solution in which hydrochloric acid is present, and aluminum chloride is present, has a so-called ionization which you say takes place anything to do with the reaction which you say occurs between the aluminum chloride and the hydrochloric acid that is also present?

A. At room temperature you will at first get some urea hydrochloride, and as the temperatures goes up, that urea hydrochloride will slowly break up.

Q. 239. We are going to hold the temperature at room temperature all the way through.

A. You will get a slow hydrolysis, and you will have a final breakdown. You will apparently get formed ammonium carbonate forms in the processing, because we have noted effervescence in the past.

By the Court: "Room temperature" means what?

By Mr. Merriam: It means around 68 to 72 degrees Fahrenheit, your Honor.

By Mr. Merriam:

Q. 240. Am I correct?

151 A. I believe that is right.

Q. 241. Now, if we took urea hydrochloride and put it in water, by itself, would that material have a pH

which is higher or lower than that of hydrochloric acid itself?

A. I cannot answer that question, because I do not know.

Q. 242. Does anybody know?

A. Someone may know, someone who may have prepared the urea hydrochloride.

Q. 243. In order for urea hydrochloride to be acid, it would have to ionize, would it not?

A. That is right.

Q. 244. Don't you know, as a chemist, that it would ionize less than the hydrochloric acid itself?

A. It may.

Q. 245. Do you know of any addition product that is comparable that ionizes more than the original material?

A. I do not recall any offhand.

Q. 246. You testified about the Shipp patent, 2,174,534, in which urea was added to concentrated sulfuric acid. In that case, the urea formed an addition product with the free sulfuric acid, did it not?

A. I believe it did.

152 Q. 247. And would you expect that markedly to lower the corrosiveness of the acid, because of that addition?

A. It may, because you cannot tell how much was actually used. They used varying strengths of acid and varying amounts of urea.

Q. 248. I think he said in one case he used 96 per cent acid and added up to 25 per cent by weight of urea?

A. That is right.

Q. 249. Take that example. Would it markedly change the corrosiveness of that acid?

A. It apparently does, if Shipp is correct.

Q. 250. You do not know whether he is correct?

A. I have not made that test myself.

Q. 251. You testified that this worked in the same way it worked in the Wallace patent, didn't you?

A. That is right.

Q. 252. Do you know whether that removes any hydrogen ions from the solution?

A. It apparently does not remove hydrogen ions, it simply binds hydrogen ions. In the case of the Wallace patent, or in the case of the Shipp patent, whether it is the urea itself, or whether it is the urea sulfate formed

that acts as the corrosion inhibiting substance I do not believe anyone is prepared to say.

153 Q. 253. Are you familiar with the tests that Dr. Wallace made, which he testified to in the Woolworth case and in this case?

A. I am not. I want to qualify that. I do not know what tests you have reference to. Some of them I recall.

Q. 254. I call your attention to pages 159 to 162 of the New York record, which has been made a part of this record, in Dr. Wallace's testimony, by reference. Have you seen those tests?

A. Yes, sir.

Q. 255. Are you familiar with them?

A. Yes, sir.

Q. 256. In those tests, Dr. Wallace measured the conductivity, or, rather, the resistivity of the solution, of the various materials to which he added urea, did he not?

A. I believe that is correct.

Q. 257. And his tests demonstrated electrically that there was no combination of urea with a solution of aluminum sulfate, did they not?

A. I do not believe the tests showed that. The tests simply showed that there was not a large resistance created in such a solution.

154 Q. 258. And Dr. Wallace testified that there would have been if there had been any combination, did he not?

A. I cannot say. I did not read that part. I recall having seen his charts, however.

Q. 259. Isn't it a fact that if you had a combination to form an addition product, that there would be an increase?

A. I do not believe that is true.

Q. 260. Have you ever tested it?

A. We made some tests along this line. We found the curves ran pretty much the same as these curves here. There was a slight variation from these curves.

Q. 261. But in general, you got the same results?

A. We got the same results, but there was a slight increase in resistance on the addition of urea. Urea itself has a tremendous resistance in solution, when it comes to ohms.

Q. 262. You said acidity was not necessary to an antiperspirant. Have you ever tested that on your own skin, or anybody else's?

A. Yes, I have.

Q. 263. In what way?

A. For example, I checked formaldehyde in a solu-
155 tion that was reasonably neutral, and it showed excellent antiperspirant properties.

Q. 264. What was the pH of the solution?

A. It was practically neutral. It was brought up to neutrality with litmus paper.

Q. 265. Is formaldehyde used as an antiperspirant in the trade?

A. It has been used. I believe there may be one or two products on the market that still use it. It is one of the finest.

Q. 266. Do you know of any product on the market now that uses it?

A. Offhand, I do not know. The last time I looked at products on the market was several years ago. The Harriet Hubbard Ayer product contained formaldehyde.

Q. 267. Does it also contain aluminum formate?

A. I do not know.

Q. 268. Did you ever analyze the product to know whether it contained formaldehyde?

A. We checked it qualitatively, yes, sir.

Q. 269. Did you check it for anything else?

A. No, sir. Formaldehyde was very evident from the odor of it, and we checked it qualitatively to confirm it.

156 Q. 270. If you had an aluminum formate, would you get an odor of formaldehyde?

A. You shouldn't.

Q. 271. Even when you put on the skin?

A. I do not know what happens to the skin when aluminum formate is put on it.

Q. 272. A little while ago, you talked about a solution of aluminum acetate that you had, which somebody else tested for you, and showed a reduction in strength, I think you said, of 34 or 35 per cent.

A. I was guessing. I do not recall the exact figures.

Q. 273. Is that the one you have in your book, at page 323?

By the Witness: May I see the book?

(Mr. Merriam handing the book to the witness.)

A. Yes, sir.

By Mr. Merriam:

Q. 274. That solution was not simply a solution of aluminum acetate in water, was it?

A. No, sir.

Q. 275. It also contained calamine in an amount two and half times as great?

A. Yes, sir.

157 Q. 276. It also contained a small amount of what you call Medication No. 158?

A. That is correct.

Q. 277. Which consisted of a number of oils? Peppermint oil?

A. I do not recall the medication.

(Mr. Merriam handing book to the witness.)

A. Yes.

Q. 278. Oil of peppermint, oil of lavender flowers, oil of white thyme, oil of abies alba needles?

A. Pine needles.

Q. 279. This solution also contained alcohol?

A. That is correct.

Q. 280. Did you ever test a solution of aluminum acetate by itself?

A. No, sir.

Q. 281. What is calamine?

A. Calamine is basic zinc carbonate, or it may contain a substantial amount of free zinc oxide or zinc carbonate, it has a mixed composition.

Q. 282. Do you recall that on page 324 of your book you say:

"This formula is mild indeed, and can be used by most anyone."?

158 A. I recall some such statement.

Q. 283. I wish you would read the paragraph appearing at the top of page 324, and I ask you if that is an accurate statement of what you said?

A. Yes.

Q. 284. Will you read it to the Reporter?

A. "This formula is mild indeed, and can be used by most anyone. It is mild enough to apply after shaving or use of depilatory, and is more of a neutralizer for body odor than an astringent, yet the presence of aluminum salt puts it in the antiperspirant classification. This preparation hardly interferes with the flow of perspiration."

Q. 285. "—hardly interferes"?

A. Yes, sir.

Q. 286. In aluminum salts, is it a fact that the more strong the acid with which the aluminum is combined, the

more astringent or more effective is the antiperspirant quality?

A. I would answer that in this way: that aluminum chloride is more effective than aluminum sulfate. Aluminum sulfate is more effective than aluminum nitrate; and so on down the series.

Q. 287. The stronger the acid, the stronger is the
159 antiperspirant?

A. Not necessarily. In the case of aluminum salts, that is true.

Q. 288. I am talking about aluminum salts.

A. Yes, sir.

Q. 289. And isn't it a fact that if you add an alkali to aluminum chloride, you bring it back toward the salts of aluminum and the weaker acids in its quality?

A. It all depends upon what alkali you add.

Q. 290. Let us add borax.

A. You may get some aluminum borate formed there by interaction.

Q 291. And the pH is raised, is it not?

A. The pH will go up, yes, sir.

Q. 292. If you add the borax in equivalent reacting quantities to the aluminum, let us say chloride, what will be the resulting pH?

A. I could not guess at that, because I have not tried it. I would expect it to come up substantially.

Q. 293. You could neutralize it, couldn't you?

A. I should think you could, because borax has a pH that is quite alkaline. Technically, you could bring it up to the point where it was alkaline.

Q. 294. At what point would it cease to be corrosive
160 to clothing under the ironing test?

A. I do not know as anyone can tell you. You would have to try it out.

Q. 295. Isn't it true of all of this, that you have to try it out before you know anything about it?

A. I think you do have to try it out. I think methodical experimentation will tell you where to stop it.

Q. 296. I wish you would look at the Schupphaus patent, No. 514,838. There the material that was employed was an explosive, was it not?

A. I believe that is right.

Q. 297. And they wanted to neutralize free acid that was present, is that right?

A. Either present—

Q. 298. Or to be formed?

A. That is right.

Q. 299. And they had previously used alkalies for that purpose?

A. That is correct.

Q. 300. Am I correct in saying that the two defects of the alkalies were, (1), that they were not combustible, that is, that they did not burn up when the explosive was ex-
161 ploded, and, (2), that they were not soluble in what vehicle there was, and therefore did not penetrate the explosive and neutralize it throughout?

A. I think that is an assumption that we are making, isn't it? I do not believe it is stated as such in the patent.

Q. 301. Do you think that is a proper assumption, or is it stated?

A. I do not know very much about the manufacturing of gunpowder. I do not know whether it is a proper assumption or not.

Q. 302. Is urea completely combustible?

A. Urea is, as far as I know.

Q. 303. There is nothing in it that would leave a residue on combustion?

A. You could let it get a residue of carbon, or some mixture.

Q. 304. Carbon is combustible, isn't it?

A. Under certain conditions. A lot of the soot floating around doesn't seem to be.

Q. 305. Isn't carbon used in gunpowder?

A. I think in the old black powder it is used in the form of charcoal, but you have a sufficient oxidizing agent in the form of nitrate, to oxidize it.

Q. 306. Is there enough oxidizing material in urea
162 to oxidize the carbon?

A. I do not know.

Q. 307. Is there any necessity, under the Schupphaus patent, for keeping the explosive at a low pH?

A. You mean at an acid pH?

Q. 308. Yes, a pH of 2.5 to 3.5?

A. I was not aware of any when I read the patent.

Q. 309. Do you know of any now?

A. I do not recall any, I cannot think of any.

Q. 310. All that you had to do there was see that you did not get any acid?

A. What you want to be sure of there, in my understanding of the patent, is to so bind the acid that you do not get any decomposition or corrosion.

Q. 311. But you do not have to keep the explosive in an acid condition in the meantime, do you?

A. To make it explode?

Q. 312. Yes. In fact, you do not want to keep it in an acid condition, do you?

A. There, I have to assume, as you do. I have not made any gun powder. I do not know anything about it. I have to assume Schupphaus is correct.

Q. 313. Is there anything in the patent that says you want to keep your explosive at a low pH?

163 A. I do not recall having seen anything to that effect. The only thing the patent mentions is they wanted something to neutralize any acid present, or any acid forming as a result of aging the composition.

Q. 314. Will you look at Missbach, 2,069,711? Missbach claims quite a number of things that will work in place of urea, does he not?

A. At the bottom of page 1, line 55, column 2, he mentions a family starting with urea, and derivatives of it, the term "ureides".

Q. 315. Then, on page 2, he has more paragraphs?

A. Yes.

Q. 316. One of the things referred to at line 10, of page 2, is guanidine?

A. That is correct.

Q. 317. Do you think guanidine would work satisfactorily for his purposes?

A. For Missbach's?

Q. 318. Yes, sir.

A. I think it might.

Q. 319. Is guanidine an alkaline material?

A. It is a reactive group.

Q. 320. Is it alkaline?

A. I do not recall at the moment whether it is or
164 not. I have never checked it.

Q. 321. Do you know the formula for guanidine?

A. Offhand, I do not recall it. I know it is an amino compound.

Q. 322. Is carbon tetrachloride normally acid if it is pure?

A. When it is chemically pure? I have never taken its pH, I cannot say. But I know that halogenated solvents

as a group tend to pick up moisture, and decomposition slowly sets in.

Q. 323. But it is undesirable that it be acid, is it not?

A. It is undesirable to have these acidic by-products.

Q. 324. Just answer the question. Is it undesirable to have it acid?

A. I do not think I can answer that question accurately, because I do not know the original pH of the carbon tetrachloride, and since acidity covers the complete gamut from pH 0 up to pH 7, I cannot answer that.

Q, 325. Do you know of any use of carbon tetrachloride for which it is desirable to be acid?

A. Offhand I do not.

Q. 326. Does Missbach tell of any?

165 A. I do not recall having seen any in there.

Q. 327. Let us go back to Mr. Shipp for just a moment, 2, 174, 534. Isn't it a fact that the urea that he uses there is nothing more or less than a non-aqueous diluent, he could not add water, but he had to add some other diluent?

A. I do not believe that is true.

Q. 328. Doesn't he say so on page 5, in the first column, in effect, where he gives a whole list of other materials that will do the same thing, including ethers, acetone, ketone, etc.?

A. Column 1, page 5?

Q. 329. Yes.

A. He mentions a lot of other corrosion inhibitors which he can use to carry out his patent.

Q. 330. Is alcohol normally considered a corrosion inhibitor?

A. I believe in the use of alcohol in his product, if I remember his patent correctly, he used that to get a special effect on cloth, when the alcohol was added he got one type of parchmentizing, and when the alcohol was not added he got a different type of parchmentizing. That resulted in the formation of cloths that are called differently in 166 the trade. I do not recall the names. I am not acquainted with textiles that well.

Q. 331. I call your attention to page 5, column 1, beginning at line 26, where he says:

"Low molecular weight alcohols soluble in concentrated sulfuric acid have also been found to be effective inhibitors for use with sulfuric acid of at least 80% concentration, including glycerol, methanol, ethanol,"

and some others; is that correct?

A. That is correct.

Q. 332. Methanol is ordinary methyl alcohol, is it not?

A. That is correct.

Q. 333. And ethanol is ordinary ethyl alcohol?

A. That is correct.

Q. 334. Do you think that has any chemical effect on the sulfuric acid?

A. Of 80 per cent concentration? I think there probably is some chemical reaction taking place; how much I do not know, but some. You will undoubtedly get some ethyl sulfate, complex ethyl sulfate, when you have ethyl alcohol in combination with sulfuric acid of that strength.

Q. 335. To what proportion would the ethyl alcohol react?

A. It is purely a guess, I do not know.

Q. 336. More than 5 per cent?

167 A. I could not tell. I think it would depend on the conditions.

Q. 337. Isn't it also a fact that, even using urea to the utmost extent shown in Shipp, the material still is quite corrosive to cloth?

A. I do not know as you can draw that conclusion from the patent. He mentions the fact that if the combination of his corrosion inhibitor plus the sulfuric acid does not reduce the tensile strength of the cloth more than 25 per cent, he considers it as a compound worth-while trying. I believe that is mentioned some place.

Q. 338. I call your attention to page 1, column 2, beginning at line 22, where he says:

"If a cotton fabric is immersed in 96% sulfuric acid at room temperature, removed immediately and rinsed very quickly with a large volume of water, the fabric is disintegrated and destroyed. However, if as much as 25 parts by weight of urea is first added to each 100 parts of acid, then a fabric may be treated with this solution up to 60 seconds without being appreciably tendered."

A. That is right.

Q. 339. Does he mean by that, if you put it in over 60 seconds, it would be appreciably tendered?

A. He undoubtedly would, at that rate of acids to 168 urea. You certainly would not get that much acid in an antiperspirant product.

Q. 340. No. What I asked you first was whether Shipp wasn't corrosive to cloth, even with the utmost quantity

of urea added that he shows, and I believe now you agree that is so?

A. There is a time limit he puts into the patent itself.

Q. 341. A very short time limit?

A. In this particular case, with a high concentration of acid, it was a short time limit.

Q. 342. Is there any place in there that he tells you that urea could protect for an indefinite period, under his conditions?

A. He does not say that. That protects it for 60 seconds. It is possible that something more will protect it longer. He does not have an equivalent weight there, and I believe the Wallace patent uses equivalent weight. We know if Wallace uses less than the eqivalent weight, he will get corrosion, too.

Q. 343. How much urea would you have to add with 96 per cent sulfuric acid to get complete protection against tendering?

A. Let us bring it up to 100 per cent.

169 Q. 344. All right.

A. At 100 per cent, your molecular weight is 98, for the sake of argument, is that correct?

Q. 345. Yes.

A. The molecular weight of urea, is, I believe, 60 and a decimal. One molecular weight of sulfuric acid would then react with 120—I should say, one gram molecular weight of sulfuric acid would react with 120 grams of urea, that would be the equivalent.

Q. 346. Then, if you added 120 parts of urea to 98 of sulfuric acid, you would get your reacting proportions, is that correct?

A. You would get your reacting proportions.

Q. 347. Do you think, if you do that, it would be corrosive to cloth any more?

A. I could not tell.

Q. 348. What do you think the pH of the solution would be at that time? Do you think it would have changed?

A. Yes, there would undoubtedly be a slight change in pH. It would probably have a very, very low pH. The chances are it would be lower than 1.

Q. 349. How closely can you control egg albumen as to its quantitative effect on a given precipitant?

A. Probably no more closely than the hen that laid
170 the egg. Egg albumen is usually believed to have a reasonably uniform composition. It will vary with the season of the year.

Q. 350. Aren't the results obtained by attempts at precipitation as albumen extremely variable?

A. I would not say that. I think, in the leather industry in particular, that has been the standard test.

Q. 351. Don't you know that it is not the standard test in the antiperspirant industry?

A. I do not believe there is any standard test in the antiperspirant industry.

Q. 352. If there is one, you do not know of it?

A. If there is one, I do not know of it.

There is no standard test. There are tests. There is none that is accepted as standard.

By Mr. Merriam: That is all.

By the Court: Any redirect?

By Mr. Sheridan: No, I have no redirect, your Honor. Defendant rests.

Whereupon The Defendant Rested Its Case.

By the Court: It is hardly worth-while to start rebuttal now.

By Mr. Merriam: I would appreciate it if we may 171 stop now, and resume in the morning. I think we can finish in the morning.

By Mr. Sheridan: Is it likely that your Honor will want to hear argument immediately following the conclusion of this?

By the Court: I think I can read some argument with more understanding than if I listen to oral argument first. When I have oral argument, I prefer to have it after I have read the briefs.

By Mr. Sheridan: That, of course, will be based on time enough to obtain the record before our briefs are due?

By the Court: Yes.

By Mr. Merriam: I want to submit the record of this one phase to New York, and see whether they want me to take any testimony.

By the Court: We won't consider the case closed, then, until you have communicated with New York.

Ten o'clock tomorrow morning.

(An adjournment was taken until 10:00 o'clock a.m. of the following day, Friday, December 21, 1945.)

172 Friday, December 21, 1945,
10:00 o'clock a.m.

Resumed, pursuant to adjournment.

Present:

Chritton, Wiles, Schroeder, Merriam & Hofgren, (141 W. Jackson Blvd., Chicago, Ill.), by Charles J. Merriam, Esq., of Counsel, On behalf of Plaintiff.

Sheridan, Davis & Cargill, (135 S. La Salle St., Chicago, Ill.), by Thomas H. Sheridan, Esq., of Counsel, On behalf of Defendant.

173 By Mr. Merriam: Are you offering the amendment?

By Mr. Sheridan: No, I have no amendment at this time.

By Mr. Merriam: Mr. Teller, will you take the stand?

Thereupon the Plaintiff, to further maintain the issues on his behalf, introduced the following evidence, in rebuttal, to-wit:

W. KEDZIE TELLER, called as a witness on behalf of the Plaintiff, having been previously duly sworn, resumed the stand, and testified in rebuttal as follows:

Direct Examination by Mr. Merriam.

Q. 1. You are the same Mr. Teller, who testified here yesterday?

A. I am.

Q. 2. During the course of the examination yesterday, there was some discussion about ionization and hydrolysis, and I wish you would explain to the Court what the difference between the two terms is.

A. Your Honor, ionization, as previously explained
174 by myself, is a breakdown in water solution of a chemical compound into its separate ions, its basic and specific ions. In other words, water alone can break down into negative OH ions and positive H ions, and other soluble materials, that is, water soluble materials of an inorganic nature also can break down in the same manner,

such as ordinary table salt, or sodium chloride, can break down into Na ions and Cl ions.

On the other hand, hydrolysis is an entirely different phenomenon. You cannot have hydrolysis with water alone. You must have some second material present dissolved in the water, some material that is not as stable, we might say, as ordinary sodium chloride, a material preferably that is a compound of a weak base and a strong acid, or of a strong base and a weak acid.

When such a material is dissolved in water, there is a tendency for the more powerful of the two ions, if it happens to be a strong acid salt, to combine with some of the H ions of the water. On the other hand, if, for some reason, one of the ions might enter into a reaction with something that the solution is brought in contact with, that weaker ion might be taken out of solution. For instance, in the example of aluminum hydroxide, we had the weak
175 aluminum ion combining with the weak OH ion, being precipitated and removed from the solution, which left an excess of the H ions that were normally combined with the OH of the water, to combine with the SO_4 ions of the sulfate.

Q. 3. Does ionization occur only in water?

A. No, it can occur in some other solvent. For instance, in anhydrous ammonia.

Q. 4. Does hydrolysis occur only in the presence of water?

A. The definition of "hydrolysis" is that it must occur in water.

Q. 5. I wish you would turn to the Koch patent, No. 2,011,292. Will you discuss that patent?

A. In the Koch patent, the inventor claims that he has discovered that when he adds products such as urea to a solution of either normal or basic aluminum formate, that he stabilizes that solution so that it will be possible to evaporate off all of the water and maintain the resultant solid in a dry state indefinitely, and then, at some later time, redissolve it in water, under which conditions it is entirely soluble. In other words, it is some mysterious means of stabilizing the product. I say "mysterious", because the problem involved in this particular discovery was that of preventing the splitting-off of formic acid,
176 in the case of basic aluminum formate, from the compound, then we would expect the urea to combine with the formic acid.

In turn, we would expect the aluminum ion to combine with water and precipitate it as an insoluble material, but Koch definitely states that the resultant product in his combination is wholly soluble after it has been dried down and redissolved in water. So that it cannot be that the theory of the urea combining with the formic acid holds in this particular instance, so that this patent would teach us nothing about the problem of stabilizing aluminum chloride.

Q. 6. Had you finished?

A. No.

Q. 7. Go ahead.

A. On the other hand, there are some other differences. While basic aluminum formate, and aluminum formate are both salts of aluminum, and might be expected to act as antiperspirants, actualy, we know that they do not, from practical tests that have been made. The acetate and formate ions are apparently too weak to enable the aluminum hydroxide that is set free to function properly. Furthermore, alone, without the presence of any urea, basic aluminum formate and aluminum acetate, either alone, 177 or together, will not have any deleterious effect on cotton fabric. So that there is nothing in the patent from those two angles that would indicate there is something here we might have gotten information from before this discovery of Wallace.

Q. 8. You stated the basic aluminum formate would not attack cloth. Does your answer also include the normal aluminum formate?

A. My experience has been with the basic aluminum formate and the normal aluminum acetate, so that I would conclude that neither the normal aluminum formate nor the basic aluminum acetate would react.

There is one other point in Koch's patent. He mentions that this is a combination of materials that are not harmful to fabric. My construction of that statement is that none of the individual components of his combination are harmful, in other words, he would not want to add something like urea to stabilize his product if urea alone were harmful to fabric and he knew that his formate solutions alone were not harmful to fabric.

Q. 9. You are referring to page 1, column 1, lines 37 to 42?

A. That is correct.

178 Q. 10. Will you read that?

A. "The solutions of these products may be used with special advantage in the textile industry because they do not contain any substances which would have a detrimental effect when used, for instance, for impregnation purposes."

Q. 11. You interpret that to mean that there is not any product alone or combined that would have that effect?

A. I believe that no other interpretation could be given, because he says "do not contain any substances".

Q. 12. Is it a fact that the solutions of aluminum acetate in water does combine to hydrolyze, and produce a precipitate on standing?

A. Very readily.

Q. 13. And that precipitate is what?

A. That precipitate is aluminum hydroxide, or it might be a combination of the aluminum hydroxide and a very basic aluminum acetate.

Q. 14. Is there any other product resulting from that decomposition, or hydrolysis?

A. The other product, the weakest kind, would be the acetate acid.

(Short interruption.)

Q. 15. You had just stated that when aluminum acetate hydrolyzes in water, it produces an insoluble basic com-
179 pound, and some acetic acid?

A. Yes.

Q. 16. Will you state, from a chemical standpoint, what would occur if the acetic acid were removed from that solution that is formed?

A. If the acetic acid were removed from such a solution, the tendency would be for more basic aluminum acetate or aluminum hydroxide to form. Once you disturb a reaction by removing one of the resultant products, it tends to go towards completion.

Q. 17. Would you expect that result to follow if you reacted acetic acid with urea?

A. It would.

Q. 18. Will you turn to the Schupphaus patent, 514,838, and discuss that patent?

A. The Schupphaus patent is a patent in which the inventor sought to overcome the difficulties of neutralizing certain amounts of free acid in certain types of explosive nitro-compounds, nitrocellulose, and so forth.

In the past he explains that insoluble inorganic alpha materials, such as he mentions in line 35, column 1,—that particular one he mentions is a soluble inorganic material,
silicate of soda—he found did not function advantage-
180 ously, because, in the first place, they would not be
combustible. In the second place, they could not be made to penetrate the grains of one of these nitro compounds. All they could be made to do was cut the outside of the grain, because they would not be soluble in anything that would penetrate the grain without disintegrating.

Q. 19. Does he say that, or does he merely say they are unsatisfactory, and those are your reasons?

A. He mentions the urea is soluble, so one can draw by inference from our knowledge of the other materials that that was one thing he was trying to do. He found that urea was one material that would dissolve in solvent that would penetrate these grains of explosive and soak out any free acid that happened to be present, and combine with it.

I cannot see that there is anything there that would teach Wallace that the use of urea would stabilize aluminum chloride.

In the first place, all of these nitro compounds that Schupphaus is talking about are water insoluble materials, whereas aluminum chloride is highly water soluble. In the second place, they are not astringents in any sense of
the words, they could not be used as antiperspirants,
181 so I cannot believe there is any teaching there that
would enable Wallace to work out his problem.

Q. 20. Will you refer next to the Missbach patent, 2,069,711, and discuss that patent?

A. The Missbach patent covers the field of dry cleaning solvents, and the stabilization of them. Dry cleaning solvents, particularly chlorinated hydrocarbons, such as carbon tetrachloride, that is the most common one, after they have been used over and over again, become contaminated with soil, and must be regenerated by distillation, and if there is any water present, particularly during the elevated temperature of distillation, there is a tendency for these chlorinated compounds to hydrolyze and put off hydrochloric acid.

Missbach discovered that urea was soluble material, and therefore it would stay in solution in the carbon tetrachloride and neutralize this hydrochloric acid. He also

discovered that another material which was equivalent in its effect to urea would be guanidine, which, while it does have an amino compound in it, as Wallace has described several of his alternate materials must be, guandine is
182 very highly alkaline, and would have had the effect of completely neutralizing an antiperspirant salt, such as aluminum sulfate or aluminum chloride. These halogenated solvents are wholly water insoluble within the ordinary sense and meaning, consequently they are not at all antiperspirant. The amount of urea present is so small that it would have no effect if the same proportions were used in conjunction with aluminum chloride, and, secondly, the alternate material which he uses, guanidine, would react with the aluminum chloride and sulfate to neutarlize it. So that I cannot see that there is any teaching in this patent that would help Wallace overcome his difficulty.

Q. 21. Will you refer to the Shipp patent, 2,174,534?

A. The Shipp patent discusses a process for treating cotton fabrics, the treatment being an immersion in sulfuric acid, to have an action on the fibers that would more or less partially hydrolyze them so that they would be changed in character to have sheen, rather than the dull effect of the ordinary cotton sheeting.

He recognized that the time-honored process of treating cotton fabrics with concentrated sulfuric acid had the shortcoming of being very hard to control. If the fabric were left in the solution of acid maybe a few seconds too long it would be completely disintegrated. So
183 that he discovered, if he could dilute that acid without adding water to it, he could delay the action sufficiently so that he could have a factor of safety in his treatment.

He discovered that there were several materials that he could use to dilute the acid that did not contain water, and I might explain that the reason why he did not want water present is that the action of the sulfuric acid on the cellulose fibers is a result of dehydrating the fibers. In cellulose fibers, we have several or many OH or H_2O groups, and the tendency is for sulfuric acid to take told of these groups and pull them out of the molecule. So that if he had water present, his compound has a means of diluting the acid, the acid would not have the quality of taking hold of these water groups in the cellulose molecule. Therefore, he used successfully such things as ordinary ethyl alcohol and methyl alcohol, and also urea. He found that when

he added urea, he got a solution effect similar to that of adding a certain per cent of alcohol, and he found that the delayed action was such that he could safely treat fabric. At the same time, I have made experiments with this same combination, particularly the one mentioned in line 22 184 to line 29, in the second column, first page, and found that if I left the cotton fabric in the solution of sulfuric acid and urea for as much as five minutes, it was wholly disintegrated. In other words, there was a progressive disintegration which he actually wanted up to the first sixty seconds immersion. From there on, it was completely disintegration at the end of five minutes.

Sulfuric acid in that concentration, 96 per cent, could not be used on the skin of a human, it would be ruinous to the skin. It is not known to be an anti-perspirant. The amount of urea, or, I should say, any amount of urea that conceivably could be added and still maintain the parchmentizing effect of the acid would not protect fabric from corrosion, it would merely delay the corrosive action. In consequence, I cannot see that there is any teaching there that would help Wallace solve his problem.

Q. 22. With respect to this dehydration that you mentioned, will you state what happens if you put concentrated sulfuric acid on a piece of paper, for example?

A. The result is immediate blackening. The end product is the carbon, and the water out of the cellulose molecules has been taken up by the sulfuric acid. The same 185 thing holds true of sugar, or similar compounds.

I might add that in addition to what I said about the Shipp patent, whereas ethyl alcohol and methyl alcohol were equivalent for his purpose to urea, they would not be at all equivalent in preventing the action of aluminum chloride on fabrics. In fact, solutions with as much as 25 per cent ethyl alcohol, solutions of aluminum chloride with as much as 25 per cent ethyl alcohol, have been used for years, because they evaporate more quickly than the straight water solution, but still they corroded the fabric and injured the skin.

Q. 23. Is it also a fact that Shipp wanted to have degradation of his fabric to a certain extent, and did not want to protect it entirely?

A. Definitely, that was the purpose of his treatment.

Q. 24. I would like to refer you to the record in the Wallace against Woolworth case, at page 97, where Mr.

Klarmann, the Defendant's expert, was being examined, and on cross-examination, he was asked this question:

"XQ. 166. Could you with certainty predict from a reaction which takes place in a test tube what would be the effect or what will be the effect when applied to the
186 skin, that same compound?

"A. No, there is no such safety in predicting the physiological effects from strictly chemical experiments."

I would like to ask you whether you agree with what Dr. Klarmann said there.

By Mr. Sheridan: I object to that, as an effort to bring in some hearsay testimony. Probably the witness is qualified to answer the question directly, without having somebody else's words put in his mouth.

By Mr. Merriam: I am asking him simply to avoid leading the witness.

By Mr. Sheridan: That is one funny way to get around leading.

By the Court: All right. Go ahead. I will let him answer.

By the Witness:

A. I agree with Dr. Klarmann's opinion.

By the Court: That does not put the doctor's opinion in the record. It just simply gives the witness's opinion.

By Mr. Merriam: That is all.

187 By Mr. Sheridan: It gives prestige to Mr. Klarmann, who is not present.

By the Court: It means nothing except that that is the opinion of this witness.

By Mr. Merriam:

Q. 25. I am not sure whether you stated, but I wish, at any rate, you would state again, whether or not acetic acid itself is corrosive to clothing?

A. No, it is not.

Q. 26. Will you state at what temperatures that is true?

A. I would say at any temperature from room temperature to ironing temperature.

Q. 27. I believe you did say that aluminum acetate was not corrosive to cloth?

A. That is correct.

Q. 28. Have you tested that at ironing temperatures?

A. Aluminum acetate has been tested on cloth, yes.

Q. 29. Are you familiar with the pH of solutions of

aluminum chloride, particularly of a solution of 25 per cent aluminum chloride?

A. Yes, I am.

Q. 30. Will you state what it is?

A. The pH of a 25 per cent aluminum chloride solution is 2.05.

Q. 31. And have you tested the effect upon that pH 188 of additions of various amounts of urea?

A. Yes. I found that the addition of 1 gram of urea to 100 cubic centimeters of a 25 per cent solution of aluminum chloride had no effect. In other words, the pH remained at 2.05.

I found that the addition of 4 grams of urea to 100 c.c. of a 25 per cent aluminum chloride solution raised the pH to 2.10.

With the addition of 8 grams of urea to 100 c.c. of a 25 per cent solution of aluminum chloride it raised the pH to 2.20.

By Mr. Merriam: Direct examination closed.

Cross-Examination by Mr. Sheridan.

Q. 32. At the last of your direct examination, you referred to pH tests on a 25 per cent solution of aluminum chloride and water with various amounts of urea. What was the purpose of those tests?

A. To determine whether or not I could duplicate the results of Mr. de Navarre's experiment.

Q. 33. Is there any one of those tests which uses portions of urea and aluminum sulfate comparable to the portions recited in the patent in suit?

A. They are all below the proportions.

189 Q. 34. It is the fact, is it not, that different pH testing instruments and different technicians will obtain different specific figures in these pH tests?

A. Within certain small limits there will be variations, but the magnitude should be in the same degree. In other words, there should either be an upward progression; or, if one machine shows a result for one solution of, for instance, 3, and for a weaker solution, a weaker acid solution, of 3.5, the other machine should have these results of the same magnitude, the second machine should not show a lower pH, for instance, with a weaker solution.

Q. 35. Would you consider the difference between 1.87 pH and 2.02 pH of substantial magnitude?

A. There might be things that would influence that. In other words, the purity of the aluminum chloride might be different; but that is quite a variation. I would expect that under the same identical conditions, two technicians with a standard piece of apparatus that had been checked against standard buffer solution would give results that were within a few hundredths of a pH. We have to check that closely with the Federal Government in determining the satisfactoriness of certain foods for their specifications.

Q. 36. Can you have hydrolysis of a compound
190 without ionization?

A. No, you cannot.

Q. 37. Referring to the Schupphaus patent, it is the fact, is it not, that the Patentee had in mind utilization of the acid inhibiting property of urea, for example, in the disclosure of that patent?

A. Yes, he did.

Q. 38. And when he mentions in lines 94 and following, on page 1, that:

"The acids which have to be neutralized in such compounds are sulphuric,"

and, below:

"As the nitrate and sulphate of urea are perfectly stable",

is that not a clear indication that he recognized the formation of an addition compound between the urea and such sulfuric acid as might be present?

A. I think that is true.

Q. 39. He is, however, seeking to neutralize any destructive effect or decomposition effect of free acids which might be generated in those nitro products, is he not?

A. I think his primary purpose was to neutralize any free acid that might have been present as the
191 result of the manufacturing process, so that further decomposition would not take place. In other words, the presence of a small amount of acid accelerated the decomposition. He wanted to be sure there was not any present.

Q. 40. He was seeking by the use of urea, for example, to inhibit any such free acid, and prevent its decomposition effect, isn't that correct?

A. That is right.

Q. 41. And he does incidentally recognize that additional acid may be generated, does he not? And I will point to lines 87 and following, on page 1.

A. That is right, he does.

Q. 42. In the Missbach patent, again, the Patentee there is relying upon this acid inhibition property of urea, is he not, to protect garments against the destructive effect of acids which might otherwise be generated in the carbon tetrachloride?

A. I would say I would not call it acid inhibition. He is simply adding it as a material that will neutralize acid.

Q. 43. But that acid inhibition is the same acid inhibition which is availed of in the patent in suit, is it not?

192 A. You can call it the same function chemically. I just do not care for the term "inhibition" in this compound.

Q. 44. It is true that Missbach uses the term "corrosion inhibitor", is it not, in referring to urea, for example?

A. Yes.

Q. 45. He does wish to protect fabrics from any acids which might otherwise be corrosive of such fabrics?

A. Yes.

Q. 46. And that by the use of urea, as one example?

A. By the use of urea, or highly alkaline guanidine.

Q. 47. But he does specify urea as one substance which is available for that purpose, does he not?

A. Yes.

Q. 48. In the patent to Shipp, while he is working with a highly concentrated acid, he is utilizing this acid inhibiting property of urea to control that and to enable him to prolong the application of that acid to fabrics, is he not?

A. No. In this instance, I cannot see that he is relying upon anything but a dilution of the sulfuric acid with a material other than water, because alcohol would not

193 combine with the sulfuric acid in the same way that urea would. There is no parallel at all between your question and his purpose, so far as I can see.

Q. 49. And the fact he uses the term "cellulose degradation inhibitor", in referring to urea, does not change your opinion in the slightest degree?

A. Not in the slightest.

Q. 50. I believe you stated that the Shipp process was hard to control, is that correct?

A. The Shipp process is a safe method of treating. I said that the operation before Shipp discovered the use of these diluents was very hard to control.

Q. 51. But the process and the composition disclosed

by Shipp, in your opinion, is perfectly controllable in operation?

A. For the purpose intended, yes.

Q. 52. Yes. And he is fundamentally seeking to prevent damage to the fabric in a prolonged treatment with the desirable acid, and does by the use of urea? Is he not?

A. No, decidedly not. He is attempting to slow down the damage to the fabric to a degree that would enable him to not overstep this damage.

Q. 53. And your answer is still the same after 194 reading, in line 55 and following, column 2, page 1, where he says:

"From 10 to 30 seconds is usually sufficient, but under suitable conditions the time of contact may be 60 seconds or more, without damage to the fabric."?

A. That is right.

Q. 54. You are still of the same opinion?

A. Damage to the fabric, in my definition, is damage that would make it unfit for use; but damage to the fabric as you are construing it means exactly what he is trying to do, he is trying to chemically and physically change the nature of the fabric.

Q. 55. Superficially only, however?

A. Throughout the entire structure of the fiber. His process would be of absolutely no value unless that was what was accomplished.

Q. 56. Is it your opinion, then, that urea, even in a highly concentrated acid solution, would not exert its acid inhibiting property, even in some degree?

A. As long as there was a marked excess of sulfuric acid, I cannot believe that there would be any acid inhibiting property except that resulting from diluted acid.

Q. 57. With reference to the Koch patent, 2,011,292, 195 a solution of aluminum acetate or aluminum formate would be acidic in character, would it not, either one?

A. That is right.

Q. 58. Have you any idea what the pH of such a solution would be, taking aluminum formate, for example?

A. I know that a solution of basic aluminum formate, in a concentration of about 35 per cent in water, has a pH of about 4.7. That is about the only exact information I have.

Q. 59. And if urea be added to such a solution, there would be some acid inhibition exercised by it, would there not?

A. In my experience there would be no stabilization of

it, because we have had that problem confront us over the last seven years, and have had to rely upon other materials entirely, or upon unstable materials during the war when other materials were not available, and urea was.

Q. 60. Is it your answer that it would not exercise an inhibiting action upon the acid?

A. My experience is that it does not stabilize basic aluminum formate.

Q. 61. Can't you answer as to acid inhibition without using the term "stabilization"?

196 A. Undoubtedly there would be a combination of free acid with the urea.

Q. 62. That would be in the nature of an addition compound?

A. That is right, and that is probably the reason it did not stabilize the solution.

Q. 63. What substances would be likely to be detrimental to fabric in an ordinary solution of aluminum acetate or aluminum formate?

A. None that I can think of.

Q. 64. So that the inventor, the Patentee, was entirely in error, in the Koch patent, when he stated that:

"The solutions of these products"

that is, with urea in combination, for example,

"may be used with special advantage in the textile industry because they do not contain any substances which would have a detrimental effect when used, for instance, for impregnation purposes."?

A. No, I do not think that, at all. I think he is merely pointing out that he had a safe combination, that the addition of urea would not be detrimental, and that the materials themselves were not detrimental. Some other person might have found a means of solving the problem

197 that he purportedly solved by the addition of a product that would be harmful to fabric.

Q. 65. If the substances were not harmful to the fabric in themselves, why was it advisable to add urea, in your opinion?

A. I haven't the faintest idea of what he has been trying to do here, unless it would have some effect on dyes that might be very complicated.

Q. 66. He must have ascribed some utility to the urea, must he not?

A. He supposedly stabilized the solution, but my experience has been that you cannot stabilize the solution.

Q. 67. Can you evaporate solutions of aluminum acetate and aluminum formate to obtain powders of crystal?

A. Yes, you can. They will be insoluble, however.

Q. 68. You will not be able to redissolve them?

A. No, not to any great degree.

Q. 69. Have you tested aluminum acetate in solution to determine whether it had any antiperspirant effect?

A. Not aluminum acetate. Basic aluminum formate.

Q. 70. Normal aluminum formate, you have not tested that, either?

A. No, I have not.

Q. 71. Either with or without urea?

198 A. That is right.

By Mr. Sheridan: Cross-examination closed.

199 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

NOTICE.

Sirs:

Please Take Notice that on Thursday, December 6, 1945, beginning at 10:00 A. M. or shortly thereafter, at the office of Pennie, Davis, Marvin & Edmonds, 247 Park Avenue, New York 17, N. Y., we shall proceed on behalf of plaintiff in the above entitled case to take the depositions of John H. Wallace, Jr., Princeton, New Jersey; Wilfred C. Hand, New York, New York, and perhaps others, before a notary reporter, or other competent person.

The depositions will be continued from day to day until concluded. You are invited to attend and examine the witnesses.

Chritton, Wiles, Davies, Schroeder & Merriam,
Attorneys for Plaintiff.

Receipt of a copy of the foregoing notice acknowledged this 31st day of October, 1945.

Sheridan, Davis and Cargill,
Attorneys for Defendant.

200 PLAINTIFF'S EXHIBIT 8.

UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

(Filed Dec. 13, 1945 Roy H. Johnson, Clerk.)

247 Park Avenue,
New York, N. Y.,
December 6, 1945
10:20 a. m.

Appearances:

Chritton, Wiles, Schroeder, Merriam & Hofgren, 2800 Board of Trade Building, Chicago, Illinois, By Charles J. Merriam, Esq., for the Plaintiff.

Sheridan, Davis and Cargill, The Field Building,
201 Chicago, Illinois, By Thomas H. Sheridan, Esq., for the Defendant.

Also Present:

Pennie, Davis, Marvin & Edmonds, 247 Park Avenue, New York, N. Y., By H. Stanley Mansfield, Esq.

Depositions taken before Gertrude A. Niederer, Notary Public, County of New York, State of New York, in pursuance of notice.

WILFRED C. HAND, 32 Evergreen Court, Mountainside, New Jersey, being duly sworn, deposed and said:

Direct Examination by Mr. Merriam.

Q. 1. Mr. Hand, I show you Patent No. 2,236,387 which I would like to have marked as Wallace Exhibit No. 1, and ask if you are the same Hand who is named in that patent.

A. Correct.

(Document was received and marked Wallace Exhibit No. 1.)

Q. 2. Are you also the same Wilfred C. Hand who testified in the case of John H. Wallace, Jr. doing business as Wallace Laboratories, *vs.* F. W. Woolworth Company, in

the District Court of the United States for the Eastern District of New York?

202 A. Yes.

Q. 3. At the time you then testified, what was your occupation?

A. Research Director of Wallace Laboratories.

Q. 4. When did you become connected with Wallace Laboratories?

A. 1935.

Q. 5. Do you recall the time of the year?

A. I believe it was in the spring.

Q. 6. What was the occasion of your going to Wallace Laboratories at that time?

A. To work on anti-perspirant preparations.

Q. 7. Did you do so then after the spring of '35?

A. Yes, that is correct.

Q. 8. Have you had an active part in the manufacture of antiperspirant compounds while associated with Wallace Laboratories?

A. Yes, I have.

Q. 9. Are you still associated with Wallace Laboratories?

A. I am a director of it.

Q. 10. Are you employed by them at the present time?

A. No, not at the present time.

Q. 11. Under what trade name was the product which you made sold?

A. Arrid.

Q. 12. Will you state when you made the first com-
203 mercial batch of Arrid compound which contained aluminum sulphate and urea as the sole active chemical ingredients?

A. In the fall of 1936.

Q. 13. I show you a book and call your attention to Page 1 therein, and ask if you can identify that book and page.

A. Yes, that is a notebook of Alvero Gregson, and this page is Batch No. 1—rather, Batch No. 1 that gives the formula for Arrid. This is in the handwriting of J. H. Wallace, Jr.

Q. 14. What is the date on that page?

A. 9/28/36.

Mr. Merriam: I would like to have that page marked as Wallace Exhibit 2, with leave to substitute therefor

in the proceeding before the District Court in Illinois, Page 151 of the record in the Case of John H. Wallace *vs.* F. W. Woolworth Company in the United States Circuit Court of Appeals for the Second Circuit, if that is agreeable to Mr. Sheridan.

Mr. Sheridan: I would like a chance to inspect the book, that is all.

Mr. Merriam: Certainly.

(Page was marked Wallace Exhibit No 2.)

Q. 15. Will you state by whom the formula shown on that page was developed?

204 A. By Dr. Wallace and myself.

Q. 16. Prior to or on September 28, 1936?

A. Prior to.

Q. 17. I notice that the figures appearing on that page appear to be either abbreviations or code. Will you identify the notation on there which corresponds to the aluminum sulphate that you have already mentioned?

A. That is the first chemical listed and designated as AUS, aluminum sulphate.

Q. 18. AUS-50?

A. Fifty is the number of pounds.

Q. 19. Are all those figures pounds unless otherwise noted?

A. Yes.

Q. 20. And what is the ingredient shown on that page which designates urea?

A. HEX, h-e-x.

Q. 21. Will you state whether the formula shown on that page represents the material you sold to be marketed under the name of Arrid?

A. It is.

Q. 22. Is that still essentially the formula for Arrid?

A. Yes, it is.

Q. 23. I wish that you would look through that book, particularly at pages 2 and 3, and tell me whose handwriting those are in.

205 A. The second page is in the handwriting of Dr. Wallace. The third page is in print, and it resembles his handwriting but I am not positive that it is his handwriting.

Q. 24. Do you know when with respect to September 28, 1936 the first commercial batch of Arrid was prepared?

A. I believe that was the first commercial batch.

Mr. Merriam: That is all.

Cross-Examination by Mr. Sheridan.

XQ. 25. At whose instance were you originally directed to Dr. Wallace?

A. I believe I met him at the suggestion of Mr. Hoyt, of Carter Products.

XQ. 26. Were you then directly employed by Dr. Wallace or by Carter Products?

A. I believe I was employed by Carter Products at that time.

XQ. 27. But working under Dr. Wallace, is that correct?

A. No, prior to meeting him I was under the employ of Carter Products.

XQ. 28 Engaged in research work?

A. Yes.

XQ. 29 But after your contact with Dr. Wallace you entered his employ, is that correct?

A. Not exactly.

XQ. 30 What was the situation?

206 A. We worked together on a sort of common basis to see what we could develop along anti-perspirant lines.

XQ. 31 That work was being undertaken for Carter Products?

A. Yes, that is right.

XQ. 32 And according to the testimony in the Woolworth suit, a commercial product was compounded by you and Dr. Wallace and put on the market in some quantity under the name of Arrid before September 1936, is that not true?

A. I don't believe so. I can't say positively; I don't know.

XQ. 33 You don't recall any Arrid before this Arrid of Exhibit 2?

A. I can't recall any commercial form of that. We had a lot of formulas, though.

XQ. 34 And you went there first primarily with Dr. Wallace to develop a resin type of anti-perspirant, did you not?

A. Yes, that is right.

XQ. 35 Which is described, I believe, in the Woolworth case as a "creosol sulphonic acid compound, is that correct?

A. Yes.

Q. 36 You do not recall that being marketed under the name Arrid?

A. I don't know for sure. It may have been.

XQ. 37 This batch of Exhibit 2 you describe as Batch No. 1. As a matter of fact, it is also indicated as 207 Batch 324, is it not?

A. It may be so indicated. I don't recall. (Examining Exhibit 2.) Yes, that is right. 324.

XQ. 38 And the one to which you refer is the numeral appearing in parentheses after 324?

A. Yes.

XQ. 39 Whose decision was it to adopt a code for the ingredients in this formula?

A. We both agreed upon that for secrecy.

XQ. 40 Had that been your practice before this particular batch was noted?

A. Yes.

XQ. 41 Who selected the code words or abbreviations?

A. I believe Dr. Wallace did in that particular instance.

XQ. 42 And what was the need for secrecy, in your opinion?

A. Well, we had something that seemed to be pretty good, and the manufacturing facilities were more or less open, and we could not very easily control who came in and who went in the office or, I should say, the quarters where we were, and it seemed discreet to use terminology or designations that no one readily could identify.

XQ. 43 It would not be difficult for an analytical chemist to determine the constituents of such a batch, would it?

A. I would say it would be impossible.

XQ. 44 Would it be difficult to detect the presence 208 in substantial amount of urea in such a formula?

A. It would be difficult unless you knew it was there to start with.

XQ. 45 There are no well recognized tests for that purpose?

A. There are tests for that purpose. If he knew it was there, he could find it.

XQ. 46 And if you were looking, you could likewise find it without difficulty? Could you not?

A. If you were looking for it?

XQ. 47 Yes.

A. Yes.

XQ. 48 Approximately how large a batch was made up under the formula of Exhibit 2? I mean, that particular batch—how large was it, approximately?

A. I don't know; perhaps a hundred pounds.

XQ. 49 What period of time was required, approximately, to merchandise the amount of that batch?

A. I wouldn't know anything about that.

XQ. 50 You had nothing to do with the commercial exploitation of the product?

A. Not at that time.

XQ. 51 And at that time you were not employed by Dr. Wallace, or Wallace Laboratories, is that correct?

A. That is correct.

XQ. 52 And you were not actively engaged in the 209 manufacture of these preparations?

A. That is correct.

XQ. 53 How are you able to state, then, that the Arrid of today is substantially that of Exhibit 2?

A. Well, I am Medical Director of the company that sells it.

XQ. 54. That is what, Carter Products?

A. Yes.

XQ. 55. And you keep in touch with the composition that is put out now as Arrid?

A. Very closely.

XQ. 56. By analysis?

A. No, not by analysis but by discussion with people who are connected with its manufacture.

XQ. 57. In other words, they report to you, and you are relying upon the information which they relay to you as to its present-day composition?

A. That is correct.

XQ. 58. I note in subsequent entries in this book some indication that Wallace Laboratories was encountering some difficulty with separation; can you explain that? Do you recall that?

A. I think that was a technical matter relating to mulsification.

XQ. 59. But from time to time you did encounter a 210 separation of the liquid from the base solids?

A. I don't know whether that refers to the early manufacture or subsequently.

XQ. 60. When was it decided to apply for a patent on this composition?

A. I believe it was in '37 or '38, 1937 or '38.

XQ. 61. Was that Dr. Wallace's decision?

A. I don't know who made the decision, but I imagine it was discussed among the officers of the company.

XQ. 62. Of the Wallace Laboratories or Carter Products?

A. Both.

XQ. 63. And you ultimately did apply for the patent in suit?

A. Yes.

XQ. 64. Did you and Dr. Wallace cooperate with your patent solicitors in obtaining this patent?

A. We did.

XQ. 65. And they consulted with you?

A. Yes.

XQ. 66. Was this the first patent which was applied for on an anti-perspirant composition by you or Dr. Wallace?

A. No.

XQ. 67. Were other patents applied for before this?

A. I believe I applied for one in 1934 or '35.

XQ. 68. That was as a sole invention?

A. Yes.

211 XQ. 69. That related to an anti-perspirant?

A. Yes.

XQ. 70. Using this resin type of astringent?

A. It was a cresol sulphonic acid type.

XQ. 71. Is that "cresol" or "creosol"?

A. Cresol, c-r-e-s-o-l.

XQ. 72. And it is mistakenly described in the record in the Woolworth suit, is it not, as creosol sulphonic acid?

A. I have not seen that part of the record.

XQ. 73. Did you obtain a patent on that application?

A. No, I didn't.

XQ. 74. Is that the only one involving you or Dr. Wallace with respect to anti-perspirants?

A. Yes.

Mr. Sheridan: I think that is all on cross-examination.

Redirect Examination by Mr. Merriam.

RDQ. 75. Mr. Hand, drawing your attention to Page 1 again, showing Batch 324, I wish you would total up the total weight of that batch.

A. Well, there are 240¾ pounds, plus a number of grams of several chemicals, namely, 160 grams.

RDQ. 76. About a third of a pound?

A. Yes.

212 RDQ. 77. Do you recall whether that was the actual weight of the batch?

A. That probably is, because that is the way it is so designated and the way we customarily designated it.

RDQ. 78. You mentioned the officers of the Wallace Laboratories, referring to the date of 1937 and 1938. Was the Wallace Laboratories incorporated at that time?

A. I don't believe so. That was an error.

RDQ. 79. Do you know when it was?

A. I think it was around 1940 or 1941. I don't remember exactly.

RDQ. 80. What did you mean when you referred to the officers of the company in 1937?

A. I meant the officers of Carter Products and business representative of Wallace Laboratories.

RDQ. 81. Which was Dr. Wallace?

A. That is right.

Mr. Merriam: That is all.

Mr. Sheridan: I have no more questions.

Mr. Merriam: It is stipulated between the parties that the signature of the witness and the reading of the deposition to the witness will be waived.

(Deposition closed.)

213 JOHN H. WALLACE, JR., Princeton, New Jersey, having been duly sworn, deposed and said:

Direct Examination by Mr. Merriam.

Q. 1. Dr. Wallace, you are the plaintiff in this action?

A. I am.

Q. 2. You were also the plaintiff in the case of John H. Wallace, Jr. doing business as Wallace Laboratories *vs.* F. W. Woolworth Company?

A. I was.

Q. 3. I call your attention to Wallace Exhibit 1, Patent 2,236,387. You are the patentee, John H. Wallace, named therein?

A. I am.

Q. 4. Do you still own the patent?

A. I do.

Q. 5. What is your present occupation?

A. At the present time I am Vice President of Carter Products, Inc., and President of Wallace Laboratories, Inc.

Q. 6. What is the business of Wallace Laboratories, Inc., with respect to anti-perspirants?

A. Wallace Laboratories does research and developmental work on anti-perspirants.

Q. 7. Does it manufacture them?

A. It does not.

Q. 8. Do you manufacture anti-perspirants yourself?

214 A. Carter Products manufactures anti-perspirants, and I direct the manufacture of them for Carter Products.

Q. 9. And formerly Wallace Laboratories made the anti-perspirant which was sold to Carter Products?

A. That is correct.

Q. 10. Under what name is the product which Wallace Laboratories made and sold to Carter Products, sold by Carter Products to the public?

A. Arrid.

Q. 11. When did Wallace Laboratories commence manufacturing for Carter Products an anti-perspirant containing aluminum sulphate and urea as the sold active ingredients?

A. The fall of 1936.

Q. 12. And since 1936, up to the time when Wallace Laboratories ceased manufacturing the product, has the character of the product changed in any respect?

A. No. I should say, not substantially.

Q. 13. Is the product now sold by Carter Products as Arrid different in any substantial respect from the product made by Wallace Laboratories?

A. It is not.

Q. 14. Incidentally, do you have figures there on comparative sales by pounds of this material in 1936 and 1944?

A. I have figures on the total pounds of Arrid sold by

Carter Products during the year 1936 and during the
215 year 1944, calculated from the capacities of the jars sold.

Q. 15. Are those figures taken from records of which you have control?

A. They are taken from records to which I have access.

Q. 16. Have you direct knowledge of the amounts prepared at those times—that is, was the manufacturing done under your direction in 1937?

A. The manufacturing was done under my direction.

Q. 17. And in '44?

A. Yes.

Q. 18. Will you state what those amounts are?

A. The total figures in 1937 in pounds were 65,246 pounds, and in 1944, 1,122,451.

Q. 19. How long have you been working with deodorants and anti-perspirants?

A. Since the fall of 1932, I believe.

Q. 20. What was the first of these materials with which you worked?

A. The first product with which I worked was known as Perstick.

Q. 21. Was that a deodorant or an anti-perspirant?

A. That was a deodorant.

Q. 22. What was the first product which was an anti-perspirant?

A. A product known as Perstop.

Q. 23. What was the active astringent ingredient of
216 that anti-perspirant?

A. Aluminum chloride.

Q. 24. At that time were there other aluminum chloride anti-perspirants on the market?

A. There were.

Q. 25. Will you name at least one of them?

A. Odorono Liquid.

Q. 26. Do you know how long Odorono had been on the market before 1932?

A. I am reasonably sure it had been on the market for at least twenty years.

Q. 27. Will you state when you first met Mr. Hand who testified here today?

A. I met Mr. Hand in the spring of 1935.

Q. 28. Can you tell the circumstances under which you met him?

A. Mr. Hand was introduced to me by Mr. Hoyt, at the time Vice President of Carter Products, Inc.

Q. 29. As a result of your meeting Mr. Hand, will you state what happened?

A. Mr. Hand at that time was working independently for Carter Products. I was at that time retained by Carter Products to work on their deodorant and anti-perspirant products. It was Mr. Hoyt's suggestion that it would be advisable, if Mr. Hand and I were agreeable, for us to pool our interests and work together.

217 Q. 30. Did you work together after your meeting?

A. After meeting with Mr. Hand we agreed with Mr. Hoyt that it would be desirable for us to work together, and started to work so almost immediately.

Q. 31. Calling your attention again to the patent which is Wallace Exhibit 1, will you state when you first made a batch of material within the claims of that patent?

A. Do you mean the first commercial batch?

Q. 32. Yes, the first batch of which you have any record.

A. I believe it was sometime—

Q. 33. Do you wish to refer to the book?

A. May I?

Q. 34. Certainly.

A. September 28, 1936.

Q. 35. You are now referring to the book and to the page thereof, Page 1, which has been introduced as Wallace Exhibit 2?

A. Yes.

Q. 36. Will you further identify that book at which you are now looking?

A. That is a plant record book kept by Alvero Gregson who was at that time directly in charge of compounding of the product.

Q. 37. What does the number 324 at the top of that page signify?

218 A. I do not recall the significance of the number. It must have had some connection with preceding batches of cream that had been made.

Q. 38. Does that book contain your commercial formulas beginning with that date, from then on to the period covered by the book?

A. (Witness examined the book.) As nearly as I can determine, it does.

Q. 39. Will you state what the term AUS on page 1 indicates?

A. AUS is a code designation for aluminum sulphate.

Q. 40. What does HEX mean?

A. HEX is a code designation for urea.

Q. 41. What does the figure 50 after AUS designate?

A. Fifty is the total pounds used.

Q. 42. Of aluminum sulphate?

A. Of aluminum sulphate.

Q. 43. And in each case where a figure is used on that page as designating a quantity, will you state what it represents where no other representation is used?

A. Unless otherwise designated, the figures are all in pounds.

Q. 44. Was a commercial batch made up as set forth on that page?

A. The commercial batch was.

Q. 45. Did I ask if that was in your handwriting?

219 A. It is in my handwriting.

Q. 46. What was done with the batch which was prepared in accordance with that formula?

A. It is indicated on this page that this batch was used to fill jars on the three days subsequent to its manufacture. I know that at that time it was our practice to fill the jars, and as promptly thereafter as possible, ship them to Carter Products for their subsequent distribution.

Q. 47. Were the sales at that time made to Carter Products, or was Carter Products then operating under a different name?

A. As I recall it, the sales were made to Feminine Products, Inc., which was a subsidiary of Carter Products.

Q. 48. Do you have any of the invoices covering your sales of the material specified in this particular batch?

A. I do not have.

Q. 49. Have you checked your records to see if those are available?

A. I have checked the records and found that all invoices prior to 1937 have been destroyed.

Q. 50. Do you have the invoices for 1937?

A. I believe that those are available.

Q. 51. I show you a batch of invoices and ask you to go through them and tell whether those are the invoices for 1937.

A. (Witness did as requested.) These are invoices sent

by Wallace Laboratories to Feminine Products, Inc., 220 covering Arrid shipped to them.

Q. 52. In 1937?

A. In 1937 and 1938.

Q. 53. The first invoice is dated January 30, 1937, but carries no number; is that correct?

A. No, there is no number.

Q. 54. The first numbered invoice which I see here appears to be No. 14, of April 15, 1937, is that correct?

A. That is correct.

Q. 55. These do not appear to be in exact order, but there is a number, 246, on December 10, 1937.

A. Yes.

Q. 56. I also see a group of invoices for the year 1938 beginning with No. 432 on top.

A. Yes.

Q. 57. Are these invoices to which you have referred all with reference to the product shown in Batch 324 or substantially the same product?

A. Yes.

Mr. Merriam: I am not going to offer the invoices unless counsel desires it, but they will be available for counsel if you desire to cross-examine on them.

Mr. Sheridan: It is not clear to me just what the purpose of referring to these is, whether it is to establish 221 volume of sales in those two years, or something of that sort, but I shall object to the witness' testimony as of secondary character.

If they are merely relied upon to show that sales were made of this so-called Arrid during the two years mentioned, I have no objection.

Q. 58. Will you state what the relative proportions of urea and aluminum sulphate are in Batch 324?

A. It seems that they are approximately 20 per cent aluminum sulphate and 12 per cent urea. I have not calculated them; however.

Q. 59. Have you experimented with other substances than urea to find a protective agent for aluminum sulphate in this compound?

A. I have.

Q. 60. Have you found anything other than the urea and the compounds mentioned in the patent which will serve that purpose?

A. I have not.

Q. 61. Will you state what the problem involved in protecting against the aluminum sulphate is?

A. What the nature of it is?

Q. 62. Yes.

A. The problem involved is primarily one of protecting the skin against corrosive action of aluminum sulphate, and protecting the clothing that might come into contact with the preparation during application or after application.

Q. 63. Will adding a basic material such a borax to aluminum sulphate solve the problem?

A. The addition of the basic material to the aluminum sulphate reduces the acidity of the resultant solution, thus reducing the effectiveness of the solution as an antiperspirant.

Q. 64. Did you use alkaline materials in the test which you spoke of a minute ago?

A. Alkaline materials were tested.

Q. 65. What happened when you actually added those materials to aluminum sulphate?

A. When any markedly alkaline material is added to the solution of aluminum sulphate, either a basic aluminum sulphate is formed or, with addition of somewhat larger quantities, aluminum hydroxide is precipitated from the solution.

Q. 66. I show you a container marked Arrid. Can you identify that?

A. This material seems to be, from visual examination, identical with the present production of Arrid.

Mr. Merriam: I would like to have that marked Wallace Exhibit 3.

(Container was received and marked WALLACE
223 EXHIBIT NO. 3.)

Q. 67. From whom was that sample obtained, Dr. Wallace?

A. Carter Products.

Q. 68. Was it prepared under your charge?

A. It was.

Q. 69. And you are aware of the formula by which it is prepared?

A. I am.

Q. 70. Is that formula different in any substantial respect than Batch 324?

A. It is not.

Mr. Merriam: That is all.

Cross-Examination by Mr. Sheridan.

XQ. 71. Is it your testimony that the Arrid of today is substantially the Arrid of Exhibit 2 in the proportion of urea used?

A. It is.

XQ. 72. And you are still utilizing urea in present-day Arrid?

A. I am.

XQ. 73. Were you Vice President of Carter Products in 1937?

A. I was not.

XQ. 74. When did you take that position?

A. In the fall of 1942.

XQ. 75. Prior to that time you were not directly associated with Carter Products, is that correct?

224 A. I was not.

XQ. 76. These figures of the pounds of Arrid manufactured in 1937 and in 1944 are not figures from books of entry which you maintain personally, are they?

A. They are not.

XQ. 77. In other words, you are relying upon some books which you had access to at the Carter Products office, is that correct?

A. That is correct.

XQ. 78. And you are depending upon the entries there for your statements, without direct knowledge by yourself of their authenticity?

A. I have not corroborated those figures with my own records, which I could have done, but I know from similar comparisons in the past that they would be comparable. While I have no direct knowledge of figures that were made in the Carter records of 1937, I do know from my own records and other comparisons that they are close if not identical.

Mr. Sheridan: I shall now object to the witness' testimony as to those figures of manufacture of Arrid in the two years mentioned as being secondary in character.

XQ. 79. In the anti-perspirant Perstop to which you have referred, you relied upon aluminum chloride as the astringent constituent, is that correct?

225 A. We did.

XQ. 80. There was no urea incorporated?

A. There was not.

XQ. 81. That was in stick form?

A. Perstop was a solution of aluminum chloride.

XQ. 82. Typical of those which had been used before generally in the art?

A. Yes.

XQ. 83. Was that marketed commercially or otherwise?

A. It was.

XQ. 84. In what quantity?

A. I do not recall the figures.

XQ. 85. Over what period of time?

A. I believe it has been on the market since 1934.

XQ. 86. And is still on the market?

A. It is still on the market.

XQ. 87. And it is being sold by Carter Products?

A. It is.

XQ. 88. As an anti perspirant liquid?

A. Yes.

XQ. 89. That contains no urea?

A. It contains no urea.

XQ. 90. Is there any so-called protective ingredient incorporated in Perstop?

A. There is not.

226 XQ. 91. And the volume of sales of that product have been increasing over the period of years since?

A. They have not.

XQ. 92. Have they receded?

A. They have receded.

XQ. 93. The popularity, then, in your opinion and, according to your observation, is for the cream anti-perspirant in preference to the liquid antiperspirant?

A. It is.

XQ. 94. Whose decision was it to file application for the patent here in suit?

A. I do not recall just how the decision was reached. I believe that it was reached jointly with Mr. Hand and Mr. Hoyt, Carter Products, and myself.

XQ. 95. Is this the only anti-perspirant compound on which you have secured letters patents?

A. It is.

XQ. 96. And did you initially consult with the solicitors of this patent before the application thereof was prepared?

A. Yes.

XQ. 97. You worked with those solicitors during the preparation and prosecution of the application?

A. I did.

XQ. 98. They acquainted you with the actions of the Patent Office and obtained your aid in preparing amendments?

227 A. They did.

XQ. 99. So that you were kept fully in touch with the status and condition of the application for the patent in suit?

A. I was.

XQ. 100. Throughout its pendency?

A. I was.

XQ. 101. There was considerable testimony in the Woolworth case, was there not, with respect to an earlier cream anti-perspirant also put out as Arrid prior to your development of the formula of Exhibit 2. Do you recall that?

A. I do.

XQ. 102. And that was stated to be a composition utilizing "creosol" sulphonic acid condensed with formaldehyde, was it not?

A. It was.

XQ. 103. And that was manufactured commercially from sometime early in 1935, at least, until September 28, 1936?

A. I believe from midsummer of 1935 through to September of 1936.

XQ. 104. And that was manufactured in quantities and placed on the market under the trade name Arrid?

A. It was.

XQ. 105. That was a cream?

A. That was a cream.

XQ. 106. Do you agree with Mr. Hand that that is 228 probably erroneously designated in the Woolworth record as "creosol" sulphonic acid?

A. As I recall it from reading the record, it is referred to at times as "creosol" and sometimes as "cresol."

XQ. 107. There were not two words?

A. No, it was cresol, c-r-e-s-o-l.

XQ. 108. And that is a homologne of phenol sulphonic acid, is it not?

A. It is a similar type of compound.

XQ. 109. But in your patent you referred to the possibility of the use of salts of strong organic acids such as sulphonic acid. That reference is not comprehensive of the cresol sulphonic acid, is it?

A. It was not intended to be.

XQ. 110. In the Woolworth case there was reference by you to certain invoices from the Barrett Company purporting to establish purchase by you, or your company, of constituents from which the cresol sulphonic resin was compounded, and I refer you to those invoices appearing at page 152 and following. Do you recognize those?

A. Yes.

XQ. 111. And they are as I have described them?

A. Yes, they are.

XQ. 112. Now, the MEPC listed on some of those invoices, I assume, is the same meta para cresol which appears on others?

229 A. I am sure it must have been.

XQ. 113. What were the other constituents on those invoices, all of which I believe are prefaced "K" and have a suffix "F"?

A. I don't know what they were.

XQ. 114. It is quite probable that they were used in the compounding of your cresol product, is it not?

A. I don't know.

XQ. 115. Will you state in some detail just how that early Arrid, if I may term it that, was compounded, starting with the meta para cresol?

A. The meta para cresol was first sulphonated with concentrated sulphuric acid. It was then condensed by treating it—that is, the cresol sulphonic acid—with formaldehyde. The resulting compound was adjusted as to concentration and was used in the formulation of the cream in the form of a water solution.

XQ. 116. That is, water solution mixed with cream-forming constituents?

A. Cream-forming constituents.

XQ. 117. Do you recall the approximate proportions of the active ingredients in that early Arrid?

A. I do not.

XQ. 118. You did utilize urea, however, did you not?

A. Urea was utilized, yes.

230 XQ. 119. And you also utilized aluminum sulphate, did you not?

A. We did.

XQ. 120. Do you remember the approximate proportions of those two constituents?

A. All I recall is that the quantity of urea present was

less than enough to react with the cresol sulphonic acids present.

XQ. 121. But it was effective as an anti-perspirant or you would not have put it on the market, is that correct?

A. The product was effective.

XQ. 122. Do you recall the approximate amount of this early Arrid which was manufactured by you in '35 and 1936?

A. It would be somewhat less than 65,000 pounds.

XQ. 123. But of that order, is that correct?

A. Considerably less than that, I would say.

XQ. 124. Fifty thousand pounds, approximately?

A. The total quantity would probably not have exceeded 30,000 pounds.

XQ. 125. I believe your testimony in the Woolworth case was to the effect that you compounded a cream utilizing this cresol sulphonic acid resin initially before the addition of urea, and were brought to a realization that such cream was corrosive of garments and fabrics; is my recollection correct on that?

231 A. A cream was compounded but not sold commercially.

XQ. 126. But your first composition did not include urea, but it was generally the same; is that correct?

A. It did not include urea, no.

XQ. 127. You were then brought to a realization that in that form it was corrosive of fabrics, is that correct?

A. That is correct.

XQ. 128. How was that brought to your attention?

A. The cream containing the cresol sulphonic acid was applied to fabrics and found to destroy them on continued contact.

XQ. 129. And that was done by you or your associates?

A. It was.

XQ. 130. And that was a prerequisite to placing the composition on the market commercially?

A. That was a prerequisite.

XQ. 131. Had such tests been demanded of liquid anti-perspirants?

A. One of the major objections to liquid anti-perspirants was the damage to fabrics.

XQ. 132. So that from that knowledge stemmed your feeling that such fabric tests should be conducted?

A. That is correct.

XQ. 133. After the discovery that this first cresol compound was corrosive of fabrics, you then turned to
232 urea sooner or later to cure that condition, is that correct?

A. Yes.

XQ. 134. Was the aluminum sulphate utilized in this early Arrid from the very outset—that is, during the first tests and experiments with the cream?

A. No, it was not.

XQ. 135. But it was before you put the product on the market?

A. I believe it was, but I do not recall definitely.

XQ. 136. Why was the aluminum sulphate considered a desirable addition to that Arrid?

A. While the cresol sulphonic acids of themselves were highly astringent, they were, as has previously been pointed out, corrosive to fabrics. This was considered to be partially, at least, if not wholly, because of the extremely high acidity. The acidity of any acid can be reduced by neutralization with an alkali. Neutralization with an alkali, however, reduces the anti-perspirant action. The addition of urea to cresol sulphonic acids reduced the anti-perspirant action of the cresol sulphonic acids to such an extent that it was considered necessary to augment the anti-perspirant effect of the preparation by adding a quantity of aluminum sulphate to it in addition.

XQ. 137. Can you state the approximate proportion of aluminum sulphate which was adopted?

A. I do not recall. I believe, however, it was in the
233 neighborhood of 10 per cent.

XQ. 138. Of the total composition?

A. That is correct.

XQ. 139. You do not recall the approximate percentage of urea used in that early Arrid?

A. No, except that I know from the record that the quantities were below those necessary to neutralize the acidity of the cresol sulphonic acid.

XQ. 140. I presume in line with your earlier practice, when you finally decided upon the formula for the early Arrid to be marketed you conducted fabric tests of that cream?

A. We did.

XQ. 141. I believe there was testimony in the Woolworth suit that the cresol compound was objectionable for

other reasons, such as discoloration of garments, and so forth; is that correct?

A. That is correct.

XQ. 142. If you will turn to page 53 of the Woolworth record, the following is to be found, is it not:

"XQ. 146. Then you abandoned that sometime in 1936!" referring to previous questions regarding this cresol compound.

"A. Yes.

"XQ. 147. And you went back to aluminum sulphate as the perspiration-inhibiting agent?

234 "A. Yes, sir."

Q. You find that testimony there, do you not?

A. Yes.

XQ. 143. What you really meant was that you retained aluminum sulphate and possibly substituted some additional for the cresol sulphonic acid compound, did you not? In other words, you had used the aluminum sulphate all along, and you were now discarding the cresol sulphonic compound?

Mr. Merriam: I object to that as argumentative. I think it can be asked in clearer form.

A. That is a difficult question to answer directly. As has been traced in the questioning, the aluminum sulphate was added to the original preparation to augment its effectiveness after the effectiveness of the cresol sulphonic acid had been reduced. I suppose it could be said that when we removed the cresol sulphonic acids which were objectionable for a number of reasons, and increased the amount of aluminum sulphate, that we could say we had just increased the aluminum sulphate.

XQ. 144. In other words, I am trying to ascertain just what you meant by your answer to the question which asked you if you went back to aluminum sulphate. As a matter of fact, as I understand your testimony, you continued it.

A. I would say that my understanding of that ques-
235 tion must have been that as an anti-perspirant, in our search for an anti-perspirant we were forced to go back to aluminum salts, having experimented with cresol sulphonic acid as the anti-perspirant.

XQ. 145. But it was a fact, as I understand your testimony, that you never discontinued the use of some aluminum sulphate?

A. That is true.

XQ. 146. And your testimony is to the same effect on page 57 of the record, is it not, in the following examination:

"XQ. 190. And in 1946 when you got through with your experimental work—when you got through with the sale of the creosol sulphonic acid product, you picked the aluminum sulphate material as the active ingredient of an anti-perspirant that you intended to put out?

"A. I did."

That testimony appeared there, did it not?

A. Yes.

XQ. 147. Did you make a study of other anti-perspirants which were on the market from time to time during the period from 1932 into 1937?

A. I did.

XQ. 148. And I presume you keep yourself advised to-day as to competitive products of that character?

236 A. I do.

XQ. 149. At the time you started the commercial production and sale of what I term the early Arrid cream, there was really no other substantial volume of anti-perspirant cream on the market, was there?

A. I know of none.

XQ. 150. So that in a sense, you and Carter Products were really pioneering with the production and sale of an anti-perspirant cream?

A. To the best of our knowledge, we were.

XQ. 151. There was some testimony that it is your practice to submit samples of your anti-perspirant cream to Good Housekeeping Institute, possibly the American Institute of Laundering, is that correct?

A. That is correct.

XQ. 152. When was that practice adopted?

A. As I recall it, before any product known as Arrid was put on the market.

XQ. 153. That was done with the idea of obtaining confirmation as to the non-corrosive character of the product?

A. It was done with the purpose in mind of securing the Seal of Approval of Good Housekeeping Institute.

XQ. 154. Which of course would not be issued if the product were corrosive to garments, is that correct?

A. That is not necessarily true. Various products
237 of anti-perspirants have borne the Seal of Approval of the Good Housekeeping Institute that have been corrosive to fabrics.

XQ. 155. That seal really means nothing in a practical way, then?

A. I think it does, because whereas other products that have been corrosive to fabrics bear the Good Housekeeping Seal of Approval, they bear that seal only when it is clearly stated in their advertising and in their directions that the product must be used in accordance with directions; and it must be a fact that when used in accordance with directions there is no damage to fabrics.

XQ. 156. Referring now to page 54 and 55 of the Woolworth record, I quote the following:

"XQ. 159. You did not know in 1935 from your knowledge as a chemist that urea was a protective ingredient in any preparation in the presence of acid, that is to say, would protect any preparation that had a high acid strength?

"A. I knew that if it was added to an acid, it would reduce the acidity of the acid.

"XQ. 160. Whether there were other factors present or not, that wouldn't make any difference, urea would still act on the acid?

238. "A. Yes.

"XQ. 161. And that was known to you in 1935. That was general knowledge of all chemists?

"A. That is right.

"XQ. 162. And is that how you came to try out urea in this anti-perspirant preparation?

"A. It was."

That was your testimony in that record, was it not?

A. It was.

XQ. 157. Referring to Exhibit 2 and so-called Batch 324, I believe you were examined with respect to the significance of the No. 324 in the Woolworth case. Do you recall the essen of your testimony in that respect?

A. I don't recall that.

XQ. 158. Will you refer first to page 43 of the Woolworth record, toward the bottom, where you had given some explanation for the batch number, and state whether your testimony there now refreshes your recollection?

A. It does.

XQ. 159. There you testified, "That is a continuation of the previous numbering of the batches," did you not?

A. Yes.

XQ. 160. That would indicate some 323 experiments prior to that date, September 28, 1936, would it not?

A. It would.

239 XQ. 161. So that over the period prior to the date mentioned, you were continuously experimenting to solve the problems which confronted you in these anti-perspirants?

A. That would refer to the number of batches, commercial batches, of cream that were made up.

XQ. 162. Those were not experimental batches?

A. Those were not experimental batches, no.

XQ. 163. But you were experimenting over that period of time, were you not?

A. Yes.

XQ. 164. Now refer, if you will, to page 41 of the Woolworth record, in which, following a description of various tests which you conducted to overcome objectionable acidity and corrosive properties, you were asked:

"Q. 55. Did you continue your experiments after that?

"A. We did.

"Q. 56. And what next did you do in this development?

"A. After trying a complete range of alkalis which would neutralize the product, we started using such weaker bases or materials of a basic type such as urea and related compounds.

240 "Q. 57. And did you add urea to the creosol sulphonic acid?

"A. We found that urea reacted with the creosol sulphonic acid so that when it was incorporated in the base, the anti-perspirant products had not been reduced as markedly as with sodium hydroxide, or a strong alkali, and that in addition to that, the corrosive action of the creosol sulphonic acid was markedly reduced."

That was the testimony, was it not?

A. Yes.

XQ. 165. Will you refer to Exhibit 2 and state for the record, or translate for the record, the code terms appearing on the first four lines of that page?

A. The only code terms here that refer to the active ingredients in the property are AUS.

XQ. 166. Which you have stated was aluminum sulphate?

A. Which I have stated was aluminum sulphate, and HEX which I have stated is urea.

Mr. Merriam: Mr. Sheridan, I would like to object to going into all of these terms for the same reason that on the stipulation which you and I have as to Ever Dry's product, we have not gone into any ingredients except those which affect the anti-perspirant properties.

241 Mr. Sheridan: That is perfectly all right. I am not trying to inquire into constituents which have no effect or no pertinence to this thing. If he chooses to use the term "active ingredients" and that is properly comprehensive, he can confine his answers to it.

XQ. 167. As I understand it, those are the only two constituents appearing on Exhibit 2 which are active in the product?

A. That is correct.

XQ. 168. As I understand it, there were two somewhat diverse theories of the action of these anti-perspirants, and you subscribe to the theory that there is a coagulation between the astringent used and the proteins of the skin which in some manner acts to inhibit the flow of perspiration, is that correct?

A. The situation as far as theories of anti-perspirant action is concerned has always been confused and has not been clarified since previous testimony was taken on this. I do think that precipitation of proteins is a factor in anti-perspirant action. The extent to which it is the determining factor, however, I simply do not know.

XQ. 169. Well, some hold to the theory that there is a topical irritation, I believe the term is, resulting from the acidity of a preparation which in some way constricts the flow of perspiration. There is such a theory, is there not?

242 A. There is such a theory.

XQ. 170. But in any event, for successful anti-perspirant effect there must be some acidity of the preparation used, must there not, at least when you use these astringent constituents?

A. All astringent materials that are commonly known and used are all acidic, and of the compounds that are used it is necessary for them to be in acid media.

XQ. 171. It is desirable to maintain a certain Ph for such product?

A. That is correct.

XQ. 172. I should like to call your attention to two

typical advertisements, or so they were described, of Arrid, offered in evidence in the Woolworth suit, appearing at pages 163 and 164 of the record. There you testified with respect to those in the other suit, I believe, as being typical Arrid advertisements.

A. I did.

Mr. Merriam: I want to object to any testimony on those advertisements as being completely immaterial to this case and entirely outside of the direct examination of this witness.

Mr. Sheridan: Will counsel stipulate that such advertising has been indulged in by the plaintiff, and permit
243 me to offer photostatic copies of those two exhibits at the trial of the court?

Mr. Merriam: I will raise no objection to the degree of proof that you offer of advertisements of Arrid, but I will object to the statement that they are advertisements of the plaintiff or that they have anything to do with his case.

Mr. Sheridan: Then you do not object to the use of the photostatic copies, but you do object to the propriety of the exhibits in this proceeding?

Mr. Merriam: That is right.

XQ. 173. In your capacity as Vice President of Carter Products, do you have anything to do with the advertising policies of the company?

A. I do not.

XQ. 174. During the pendency of your application for the patent in suit, you were involved in at least one interference with another applicant named Teller, and another applicant named Montenier, were you not?

A. Yes.

XQ. 175. And by concessions of priority to you from those other applicants, you were awarded priority of invention on all but one of the claims involved, were you not?

A. I can't answer that. I don't know what the
244 technicalities involved were.

Mr. Merriam: By "you" you mean Dr. Wallace and Mr. Hand, not Dr. Wallace personally?

Mr. Sheridan: I am treating him as a co-patentee.

Mr. Merriam: We will concede that.

Mr. Sheridan: The file wrapper shows that.

XQ. 176. Will you refer to the file wrapper, particularly at page 330 and following pages? In an argument accompanying the amendment filed by your solicitor I note the term "inhibitor" is used repeatedly as referring to the

so-called protective ingredients of your application for the patent. Is that a proper use of the term "inhibitor"? In other words, does that properly designate urea and other similar constituents?

A. In what line does that appear?

XQ. 177. Page 330 in one place, third line from the bottom and the eighth line from the bottom. Page 331, lines 2, 3 and 5, for example. Page 332, second line of the paragraph in the middle of the page, and elsewhere, including the last line of page 333.

A. I would not know without reviewing this whole file wrapper again why it was referred to as an inhibitor. If would seem it might well be that it was meant as an inhibitor of corrosive action, in which case it would be
245 correctly used.

XQ. 178. I believe you testified in the Woolworth case that very substantial sums of money, running into the hundreds of thousands of dollars, have been expended by Carter Products in the sales promotion of the Arrid cream. Is that still your understanding?

A. Substantial sums of money have been expended in advertising.

XQ. 179. And are currently being expended?

A. And are currently being expended.

XQ. 180. In increasing amounts?

A. I do not know just what the appropriations are at the present time.

XQ. 181. In the patent in suit there is reference, as I pointed out before, particularly following line 20 in column 2, to the availability of salts of strong organic acids such as sulphonic acids for the astringent constituents of your patented anti-perspirant. Do you find that statement?

A. Yes.

XQ. 182. Is it your opinion that urea, when utilized with such sulphonic acids as are mentioned in the patent, reacts differently than it did with the creosol sulphonic acid compound in the early Arrid?

A. Yes, because in this instance it is stated that there are salts of sulphonic acids. The original preparation
246 did not contain a salt of cresol sulphonic acid, it contained cresol sulphonic acids.

XQ. 183. As a soluble resin?

A. As a soluble compound.

XQ. 184. Condensate?

A. Condensate.

Mr. Sheridan: I think that is all.

Redirect Examination by Mr. Merriam.

RDQ. 185. Dr. Wallace, concerning the figure you gave on the production of pounds of Arrid in 1937 and 1944, have you any independent recollection from the figures which may have been refreshed by those figures on the relative production in those two years?

A. I don't quite follow your question.

RDQ. 186. That is, as being the one in control of production, do you know of your own knowledge the ratio of production in 1944 as compared with 1937?

Mr. Sheridan: I will object to that as calling for secondary evidence.

A. I know that, as I intended to state previously in my testimony, the sales figures and the production figures were closely in balance. In other words, that over the whole period of the manufacture of Arrid, I know what our approximate inventory was at all times. I know the pro-
247 duction was approximately equivalent to sales at all times as of any one period, I should say.

RDQ. 187. And you know that your production figures were substantially the same as the figures you have given for sales?

A. I would say the production figures would be within a matter of a very few per cent of sales figures.

RDQ. 188. And those figures of production you know of your own knowledge?

A. Well, I have them in my own records.

Mr. Sheridan: The same objection is repeated to this later question.

RDQ. 189. Going back to this Perstop which was, as I understand it, an aluminum chloride liquid anti-perspirant, Mr. Sheridan asked you about the sales of that material, and you said that they had declined. Then he asked you if one of the reasons they declined was because it was a liquid and not a cream. Will you state whether that in your opinion is the only reason that the sales have declined?

A. The sales of all liquid anti-perspirants have declined. As to whether or not the sales of Perstop have declined along with others, and as to whether there is any other reason for it other than the basic reason for the decline of liquid anti-perspirants, I cannot say.

RDQ. 190. Are any of the liquid anti-perspirants made under your patent?

248 A. There are none.

RDQ. 191. When did Mum come on the market as a cream?

A. I cannot give the date, but I am sure it must—

RDQ. 192. Was it prior to 1936?

A. Oh, I would say in the early part of the 1900's, prior to 1910.

RDQ. 193. As a cream?

A. As a cream.

RDQ. 194. Do you know whether the sales of Mum have decreased since 1936?

Mr. Sheridan: I object to that as obviously hearsay, calling for hearsay.

A. I do not know.

RDQ. 195. Calling your attention to page 41 of the Woolworth record, Mr. Sheridan read you question 57 and its answer. I would like to read you question 58 and have you answer it. I will read you question 58 and its answer and ask you if you would testify the same way today:

"Q. 58. Now, what happens when you add urea to creosol sulphonic acid?

"A. The urea added to the creosol sulphonic acid combines with the sulphonic acid reducing the acidity, depending upon the quantity of urea present."

Is that a correct statement?

249 A. That is a correct statement.

RDQ. 196. Did that occur in the cresol sulphonic acid product which you made and to which you added urea?

A. Yes.

RDQ. 197. And was there any free urea in the cresol sulphonic acid product which you marketed?

A. There was not.

RDQ. 198. Calling your attention to page 60 of the Woolworth record, and particularly to RDQ. 218 to 220, inclusive, I would like to read you those and see if they refresh your recollection:

"RDQ. 218. Do you know whether the old Arrid compound with the creosol sulphonic acid in it was submitted to Good Housekeeping?

"A. It was.

"RDQ. 219. And did it receive the Seal of Approval?

"A. It did not.

"RDQ. 220. And do you know the ground on which it was refused?

"A. Because it was stated that their tests showed that it was corrosive of fabrics."

Does that refresh your recollection as to what happened at that time?

A. It does.

250 RDQ. 199. And are the statements there correct?

A. They are correct.

RDQ. 200. In an answer to one of Mr. Sheridan's questions you said in reference to Good Housekeeping's Seal of Approval that with a corrosive cream, one of the requirements was that in order to get the Seal you had to use the cream in accordance with directions, or to give directions under which it would not be corrosive. Would you state what those directions are in order to make a corrosive cream actually non-corrosive?

A. When I answered that question I was not thinking of a cream at all, but rather, at one time it was my understanding that Odorono liquid carried the Good Housekeeping Seal of Approval, and at the time that we submitted our preparation to them, the seal was refused. I inquired as to why it had been given to Odorono liquid. I was then told that it was because Odorono liquid said in their directions that the liquid should be applied, should be allowed to dry, and then the residue on the surface of the skin should be removed by washing.

RDQ. 201. Is it your opinion that under those conditions Odorono can never be corrosive to the skin?

A. Not to the skin; I think that that would have no appreciable difference in the corrosiveness to the skin. But if the directions were followed to the letter, it should

251 protect fabrics that might otherwise come in contact with aluminum chloride residue on the skin.

RDQ. 202. Calling your attention to page 55 of the Woolworth record, Mr. Sheridan read you a number of questions at the top of that page and asked if you testified in that way. I would like to call your attention to XQ. 162 in which it is stated:

"And is that how you came to try out urea in this anti-perspirant preparation?

"A. It was."

"This," in that question, refers to which anti-perspirant composition? Will you check that carefully and tell me?

A. That refers to the cresol sulphonic acid cream.

RDQ. 203. In Batch 324 you have given the code desig-

nations for the active compounds, and I am not sure whether you or Mr. Hand stated what code represented water in that formula. I think that should be stated.

A. The code WAS represented water.

Mr. Merriam: That is all.

Mr. Sheridan: I have a couple of questions:

Recross Examination by Mr. Sheridan.

RXQ. 204. The cream, Mum, concerning which you were interrogated, is a deodorant cream, is it not?

A. Oh, yes, Mum is a deodorant cream.

RXQ. 205. It is not an anti-perspirant?

252 A. It is not an anti-perspirant.

RXQ. 206. So that it would naturally not contain corrosive ingredients?

A. That is correct.

RXQ. 207. How did you determine there was no free urea remaining in the early Arrid of the cresol sulphonic acid compound?

A. That was determined on the basis of the equivalent weights; in other words, the quantity of urea added was not great enough to react with the total amount of sulphonic acid present.

RXQ. 208. That was a theoretical conclusion not developed by actual experimental test?

A. It was later determined by additional tests.

RXQ. 209. In what manner?

A. By the various kinds of activity tests that were referred to in the record.

RXQ. 210. Those were the only tests made for that purpose?

A. Yes. They seemed conclusive. It seemed that they adequately confirmed what was very clearcut theory.

RXQ. 211. Are there any other anti-perspirant creams being manufactured under the patent here in suit?

A. There is at least one.

RXQ. 212. Commercially?

A. Yes.

253 Mr. Sheridan: I think that is all.

Re-redirect Examination by Mr. Merriam.

RDQ. 213. When you referred to tests which are shown in the record, Dr. Wallace, I believe you referred to the charts shown at pages 159 to 162, inclusive, of the Woolworth record, did you not?

A. I did.

RDQ. 214. And the testimony that you gave concerning those charts which appears primarily at page 145, beginning with Q. 90 and extending over to Q. 109 on page 149 and its answer?

A. That is what I was referring to.

Mr. Merriam: That is all.

It is stipulated between the parties that the signature of the witness and the reading of the deposition to the witness will be waived.

(Deposition closed.)

255 State of New York, }
County of New York. } ss.

I, Gertrude A. Niederer, a Notary Public within and for the County of New York, State of New York, do hereby certify that the foregoing depositions of Wilfred C. Hand and John H. Wallace, Jr., were taken on behalf of the Plaintiff in pursuance of notice, copy of which is hereto annexed, before me at 10:20 a. m. on Thursday, December 6, 1945; that the witnesses were by me duly sworn before the commencement of their testimony; that the testimony of the witnesses was taken down by me stenographically and later transcribed into typewriting; that the Defendant was represented by Counsel, as hereinbefore noted, during the taking of said depositions; that said depositions were taken at the office of Pennie, Davis, Marvin & Edmonds, 247 Park Avenue, New York, N. Y.; that pursuant to stipulation entered upon the record by and between Counsel, the signatures of the witnesses and the reading of the depositions to the witnesses were waived; that I am not connected by blood or marriage with either of said parties, nor interested, directly or indirectly, in the matter of controversy.

In Testimony Whereof, I have hereunto set my hand and affixed my seal of office at New York in said County this 11th day of December, 1945.

Gertrude A. Niederer,
(Seal) *Notary Public.*
Queens Co. Clk's No. 3128, Reg. No. 111-N-7,
New York Co. Clks'. No. 253,
Appointment expires March 30, 1947.

256 And afterwards on, to wit, the 25th day of June, 1946, there was filed in the Clerk's office of said Court a certain Memorandum of the Honorable William H. Holly, District Judge, in words and figures following, to wit:

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DELL MODERN MAGAZINES' 14TH SURVEY OF BEAUTY--1945

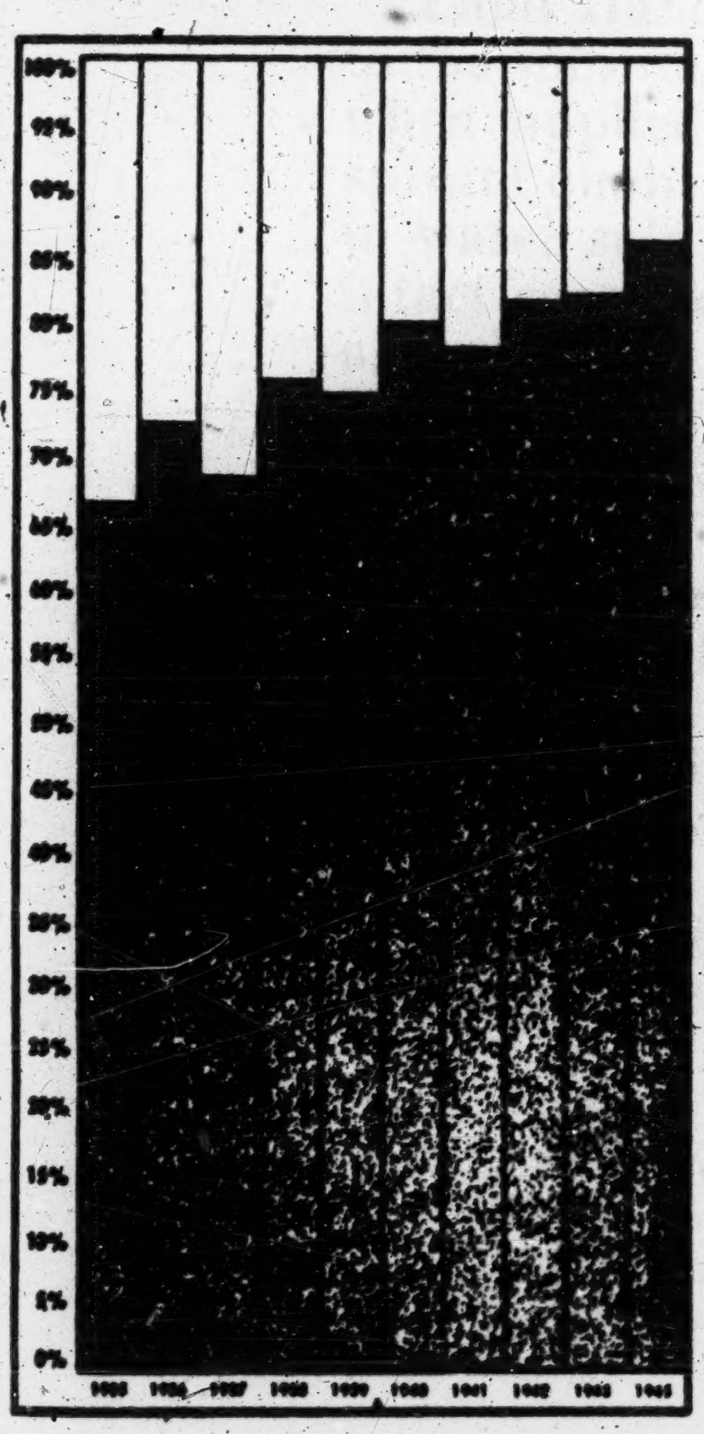
DEODORANT

LEADING BRANDS	PER CENT USE BY BRANDS — SURVEY YEAR 1935	1936	1937	1938	1939	1940	1941	1942	1943	1945	BY YEARLY INCOME—1945 Under $2000	$2000 –$3000	Over $3000	BY CITY SIZE—1945 100,000 & Over	2,500 – 100,000	Under 2,500	Grand Total
Arrid	-	-	3.0%	3.6%	10.6%	20.2%	22.5%	25.3%	32.8%	34.4%	33.7%	34.2%	35.1%	34.7%	33.5%	36.3%	34.4%
Mum	36.	44.5	46.0	53.3	50.7	42.2	42.9	37.3	36.9	28.8	31.5	28.5	26.6	26.6	31.4	28.0	28.8
Fresh	0.5	1.0	1.5	1.0	-	1.3	1.8	3.8	5.4	10.8	10.7	9.9	11.9	10.4	11.2	10.5	10.8
Odo-ro-no	24.0	24.0	19.0	15.3	10.9	12.3	11.3	9.9	7.4	6.0	6.0	6.1	5.8	6.3	5.2	7.6	6.0
Yodoro	-	-	-	-	-	-	-	-	1.4	2.6	2.4	2.4	3.0	3.1	1.9	2.9	2.6
Tussy	-	-	-	-	-	-	-	-	-	2.1	1.5	1.8	2.8	2.5	1.9	1.6	2.1
Nonspi	6.0	3.5	3.0	1.7	2.2	1.3	1.0	0.9	0.8	1.1	1.2	1.6	0.9	1.2	0.8	1.9	1.1
Avon	-	-	-	-	-	-	2.4	3.1	2.8	1.0	1.5	1.0	0.7	1.0	1.2	0.7	1.0
Ever Dry	-	-	-	-	-	-	-	-	-	0.9	0.9	0.4	1.2	1.2	0.8	0.3	0.9
All Others	33.5	27.0	27.5	25.1	25.6	22.7	18.1	19.7	12.5	12.3	10.6	14.1	12.0	13.0	12.1	10.2	12.3
TOTAL ALL BRANDS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% NAMING BRAND	66.0%	72.0%	68.0%	75.3%	74.5%	79.9%	77.9%	80.2%	81.2%	84.6%	83.7%	84.9%	86.8%	83.8%	85.0%	86.0%	84.6%
PER CENT USE								81.3%	81.7%	86.0%	85.1%	86.2%	87.9%	85.1%	86.5%	87.1%	86.0%

LEADING BRANDS	PER CENT OF ALL PURCHASES MADE IN 10c (OR LESS) SIZES — SURVEY YEAR 1935	1936	1937	1938	1939	1940	1941	1942	1943	1945
Arrid	-	-	-	44.0%	39.0%	37.3%	37.5%	32.9%	22.7%	10.4%
Mum	75.0	55.0	56.0	57.7	59.8	58.5	51.7	44.7	38.5	17.3
Fresh	25.0	17.0	85.0	54.5	-	61.1	60.0	55.4	22.1	13.1
Odo-ro-no	73.0	52.0	55.0	56.0	49.4	62.0	49.7	56.1	38.4	17.6
Yodoro	-	-	-	-	-	-	-	-	19.0	4.5
Tussy	-	-	-	-	-	-	-	-	-	0.0
Nonspi	30.0	16.0	21.0	29.2	35.3	29.4	72.7	38.5	20.0	21.0
Avon	-	-	-	-	-	-	0.0	0.0	0.0	0.0
Ever Dry	-	-	-	-	-	-	-	-	-	7.1
All Others	-	-	-	-	-	-	-	-	-	12.1
TOTAL ALL BRANDS	62.0%	53.5%	52.0%	51.7%	50.8%	50.9%	44.2%	40.8%	30.7%	12.9%

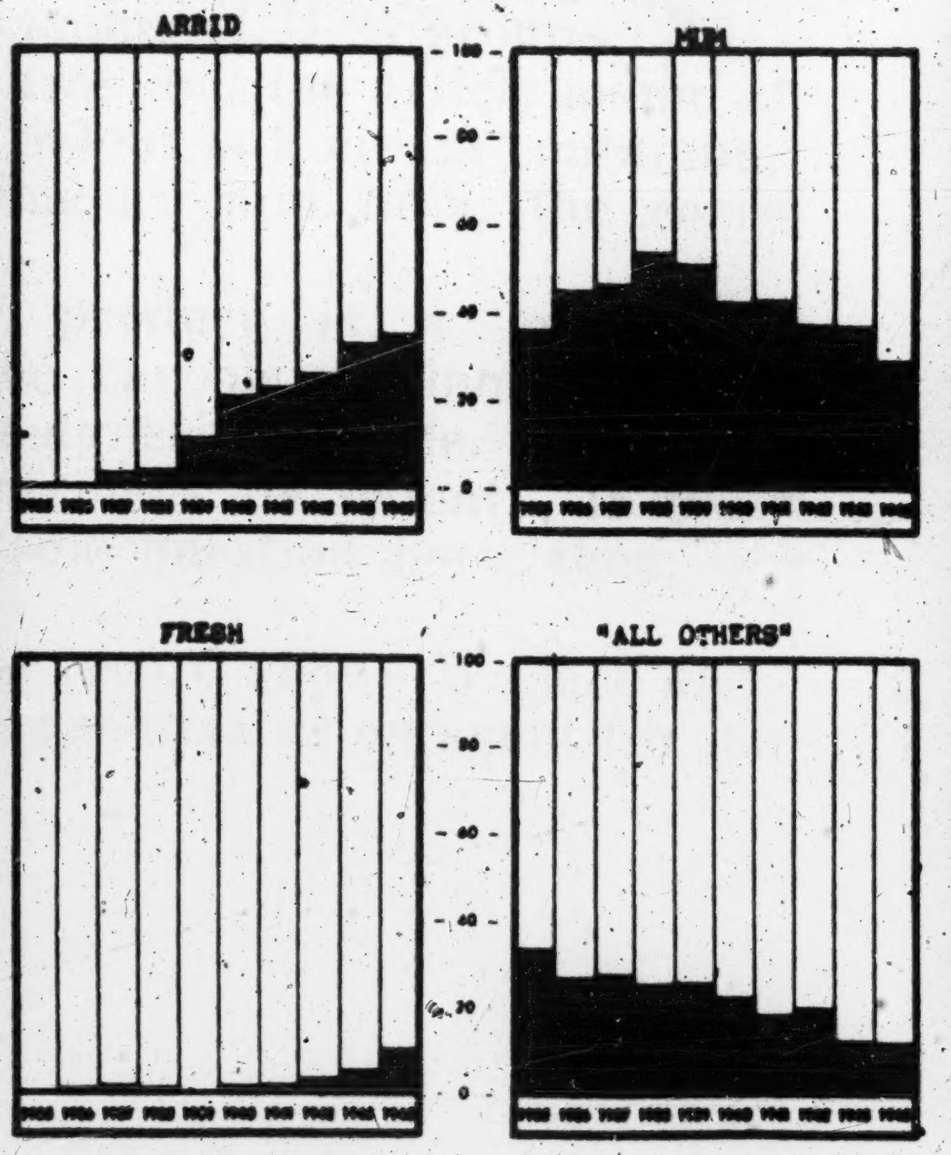
PLACE OF PURCHASE — 1945	Dept. Store	Drug Store	5 & 10c Store	Miscellaneous	Grand Total
Arrid	8.1%	46.8%	43.8%	1.3%	100.0%
Mum	7.6	44.5	46.6	1.3	100.0
Fresh	8.9	41.1	49.4	0.6	100.0
Odo-ro-no	11.8	47.3	40.9	0.0	100.0
Yodoro	13.9	67.4	18.7	0.0	100.0
Tussy	65.8	28.6	2.8	2.8	100.0
Nonspi	10.5	63.1	26.4	0.0	100.0
Avon	0.0	0.0	0.0	100.0	100.0
Ever Dry	38.5	61.5	0.0	0.0	100.0
All Others	25.6	47.7	25.6	1.1	100.0
TOTAL ALL BRANDS	11.9%	45.8%	40.9%	1.4%	100.0%

PER CENT NAMING BRAND BY YEARS

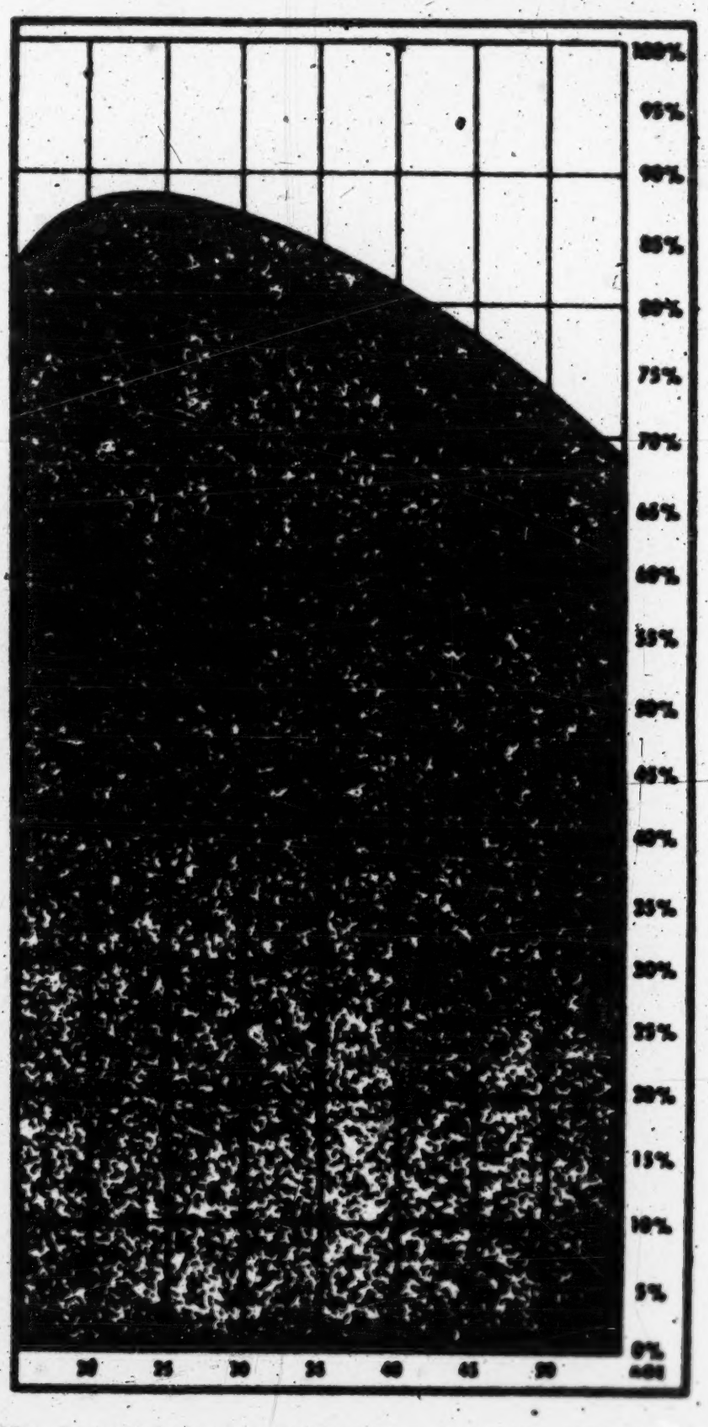


DELL MODERN MAGAZINES

PER CENT USE OF LEADING BRANDS BY YEARS



PER CENT USE BY AGE OF PURCHASER



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258 IN THE UNITED STATES DISTRICT COURT.

* * (Caption—43-C-906) * *

MEMORANDUM.

Plaintiff charges defendant with infringing Patent No. 2,234,387 to Wallace and Hand for a toilet preparation to be used to retard perspiration and prevent unpleasant body odor resulting from perspiration. Hand has assigned his interest in the patent to Wallace.

Solutions to be used for this purpose had long been on the market. Those solutions usually contained an acid salt of a heavy metal such as aluminum chloride or aluminum sulphate. The solutions were effective for the purpose intended, but after application a residue of sulfuric acid remained which sometimes irritated the skin and rotted clothing fabrics which came in contact with it. This effect could be partly avoided by permitting the solution to dry and thereafter wiping it off with a damp cloth. This took time and on occasions was inconvenient for the user. The corrosive effect could be overcome by the addition of alkaline substances but such a compound would not stop the flow of perspiration and would be valueless for the pur-
259 pose intended. The problem to be solved, as Wallace and Hand saw it, was to find a substance which added to the solution (or cream) would inhibit the corrosive effect when applied but would not interfere with its anti-perspirant quality. They had found such a substance they said in water soluble amino compounds possessing one or more intact reactive amino (UH 2) groups. The substance actually used was urea and the article manufactured by plaintiff under the patent is a cream containing aluminum sulfate, the astringent, and urea, the corrosive inhibiting agent.

Defendant's product is a cream containing urea, aluminum sulfic carbolate, aluminum sulfate, aluminum chloride and magnesium oxide. The plaintiff says this combination infringes its patent. If the patent is valid it does. The sole question here, then, is the validity of the patent.

So far as the record shows Wallace and Hand were the first persons to use urea as an agent for inhibiting the cor-

rosive action of astringents in anti-perspirant preparations. Defendant contends, however, that it had been used as an inhibitor in other compounds, and that its use as an inhibitor of the corrosive effect of acids was not new.

As evidence of the state of the art at the time Wallace and Hand applied for their patent defendant cites Patent No. 514,838 to Robert Schüphaus, Patent No. 2,069,711 to Edmund C. Missbach and No. 2,174,534 to Joseph Harrell Shipp. The patent to Schüpphaus was for a method of preventing the decomposition of nitro-compounds, such compounds being subject to decomposition when stored for a long period of time due to traces of acid or impurities of an unstable nature remaining in the compounds, such as starch, cellulose or the like, in commercial manufacturing.

To overcome this tendency alkalies had been used but
260 they had the effect of dissolving the product. Schüphaus therefore suggested the use of urea as a neutralizer which he had found effective. Plaintiff contends that here, as the inventor says, urea is used as a neutralizer, while in his preparation the acid is not neutralized and should not be, otherwise the preparation would be ineffective as an anti-perspirant. The acidity must be retained for the astringent effect otherwise the flow of perspiration will not be lessened. What is desired is the retention of acidity but with something that will inhibit the corrosive action on skin or clothes.

One of the objects of the Missbach patent was to provide an effective corrosion inhibitor to prevent damage to fabric in halogenated hydro-carbon compounds such as tetrachloride used in cleaning clothes and for that purpose he suggests the use (among other things) of urea. The inhibiting effect, he says, is accomplished as a result, first of neutralizing or removing any acid of acidic substances present; second, by retarding the production of acid, and third, by forming a protective film on the surface of metal.

I do not see anything in this patent that teaches that urea will inhibit the corrosive effect while leaving the solution sufficiently acid to be astringent.

The Shipp patent is different. It relates to the treatment of textiles, particularly cotton fabrics with concentrated sulfuric acid. This acid is useful in producing parchmentized effects and organdy finishes on cotton fabrics. But if cotton fabric is immersed in 96% sulfuric acid at room temperature, removed immediately and rinsed

very quickly with a large volume of water the fabric is disintegrated and destroyed. Shipp had discovered that if as much as 25 parts by weight of urea were added to 100 parts of acid then a fabric might be treated with this solution up to 60 seconds without being appreciably tendered. This, it seems to me, is quite like the effect produced by adding urea to a cream or solution containing aluminum chloride or aluminum sulfate which is to be applied to the skin or come in contact with fabric. The urea was not used in the Shipp patent to neutralize the acid for it was necessary to get the effect of the acid in producing the desired finish. The urea was used not as a neutralizer but for the purpose of inhibiting the corrosive action. If the addition of urea to a 96% solution of sulfuric acid will retard the corrosive or degrading effect upon cotton fabric it might well be thought it would inhibit the corrosive effect on skin or fabric of the acid residue left on the skin after using the ordinary preparations containing aluminum sulfate or chloride. I think Shipp anticipated Wallace and Hand in the discovery of the peculiar effect of urea when combined with an acid.

261

I must hold the patent invalid.

Holly,
Judge.

The parties may prepare and present a draft of a judgment order and present it at 2 o'clock, Monday, July 8, 1946. At that time also I will go over with the parties the drafts of findings of fact and conclusions of law.

262 And afterwards on, to wit, the 18th day of September, 1946 there was filed in the Clerk's office of said Court a certain Supplemental Memorandum of the Honorable William H. Holly, District Judge in words and figures following, to wit:

263 IN THE UNITED STATES DISTRICT COURT.

* * (Caption—43-C-906) * *

SUPPLEMENTAL MEMORANDUM.

After the filing of my former memorandum herein plaintiff asked for a rehearing. Briefs were filed by counsel for the parties and I heard oral argument. I have considered the briefs and argument but am still unconvinced that the opinions expressed in the former memorandum are incorrect.

In my opinion Shipp taught that the desired effect of sulfuric acid on cotton fabric, while avoiding, to a degree at least, the corrosive effect, might be obtained by the addition of urea to the acid. If the addition of urea to practically undiluted sulfuric acid would bring about the result stated by Shipp in his patent it might well be imagined that the addition of urea to the anti-perspirant cream or solution containing the small amount of sulfuric acid found in those compounds would inhibit the corrosive action of the acid on skin or fabric. Experiment proved that it did. The result of experimentation so suggested is not patentable. *Fink* v. *Foscato et al.*, 79 F. (2d) 842.

Holly,
Judge.

264 And afterwards, to wit, on the 1st day of October, 1946, being one of the days of the regular September term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable William H. Holly District Judge, appears the following entry, to wit:

265 UNITED STATES DISTRICT COURT.

* * (Caption—43-C-906) * *

FINDINGS OF FACT AND CONCLUSIONS OF LAW.

Findings of Fact.

1. Jurisdiction of this Court is based on the fact that this is a suit arising under the Patent Laws of the United States. No objection to jurisdiction or venue of the Court is made by either party.

2. Plaintiff is a citizen of the United States and a resident of Princeton, New Jersey and is the owner of the entire right, title and interest in and to the Wallace and Hand patent in suit, No. 2,236,387 patented March 25, 1941 of which claims 1 to 6 inclusive, 8 to 13 inclusive, 15 and 16 are charged to be infringed.

3. The Defendant, Mandel Brothers, Inc., is a Delaware corporation having a regular and established place of business at Chicago, Illinois.

4. Defendant is charged with infringement of the above numbered claims of the patent in suit because of the sale of an anti-perspirant paste composition known as Ever-Dry.

5. The defense of this suit with knowledge by Plain-
266 tiff has been assumed and conducted by the manufacturer of Ever-Dry, to wit: Ever-Dry Corporation, a corporation of Nevada, having a place of business in Los Angeles, California.

6. The patent in suit discloses and claims an anti-perspirant composition compounded of a water solution of aluminum sulfate, or alternatively, aluminum chloride, both well-known and long used as an anti-perspirant in liquid form prior to the invention of the patent in suit, with which is mixed or to which is added urea allegedly as a "neutral protective ingredient", the purpose of the addi-

tion of urea being to protect fabrics to which the composition may attach itself, particularly under the heat of ironing, against corrosion.

7. Cosmetic preparations for the removal or prevention of perspiration odors have been on the market for a long time and fall generally into two classes. One of these classes is deodorants, which do not seek to stop perspiration but do attempt to remove its odor. The other class, into which the Wallace Composition falls, attacks the problem by inhibiting the flow of perspiration.

Deodorants have sometimes been supplied as creams, whereas so far as the record in this case shows Arrid was the first successful anti-perspirant cream.

8. The common anti-perspirant compositions depend upon an astringent salt, generally of aluminum, and a strong acid. The effectiveness of such compositions depend upon their astringency, which is measured by the acid character of pH of a solution of the salt. The lower the pH, the higher is the acid character of the solution. 267 Any substantial increase in pH results in a loss of astringency and effectiveness.

9. The astringency of salts such as aluminum chloride and aluminum sulfate is due to a reaction between the salts and water, called hydrolysis, as a result of which hydrogen ions are liberated. Acidity is due to the formation of hydrogen ions and pH is the measure of the concentration of these ions.

10. Acidity likewise brought about certain problems in anti-perspirants. In the first place the astringent materials may attack the skin of sensitive individuals and will attack cloth, particularly when the cloth is ironed without first washing off the anti-perspirant material.

11. The corrosiveness of the anti-perspirants was known to be due to the acid character thereof.

12. Urea is an organic compound which is neutral in its action. It was known for a long time that in spite of the neutral character of the urea under ordinary conditions it did have a reaction with acids and could be added to an acid to overcome its acidity.

Urea when added to a solution in the proportion shown in the patent of an acid-reactive salt like aluminum chloride, does not materially affect the pH of the salt. In this it differs from alkalis like borax.

13. While the patent is not limited to the form of the

claimed composition, the accused anti-perspirant, Ever-Dry is in paste form.

14. Plaintiff is in charge of the compounding of a paste anti-perspirant embodying the disclosure of the patent in suit for a distributor, Carter Products, Inc., which
268 markets such product under the name of Arrid.

15. Prosecution of this action was assumed by a licensee under the Wallace *et al.* patent in suit, namely, the Pharma Craft Corporation, manufacturer of an anti-perspirant known as "Fresh".

16. Said Carter Products, Inc. and Ever-Dry Corporation sell liquid anti-perspirants utilizing aluminum sulfate or aluminum chloride as the active anti-perspirant constituent in which no urea or equivalent substance is utilized. Sale of such liquid anti-perspirants by those companies has continued over a period of years beginning before the manufacture and sale of the urea containing paste anti-perspirants. The liquid anti-perspirant of Carter Products, Inc. is known as Perstop and that of Ever-Dry Corporation is known as Ever-Dry. Other liquid anti-perspirants of a similar character have been on the market for many years.

17. The prior art before the Court in this case consists (a) of an anti-perspirant paste compounded by Plaintiff and marketed as Arrid for over a year before the alleged date of invention of the disclosure in the patent in suit; and (b) certain prior patents or patents which were applied for before the alleged date of invention of the patent in suit, namely the patents to Schupphaus, No. 514,838 of February 13, 1894; Missbach, No. 2,069,711, February 2, 1937 (filed Jan. 23, 1935); Shipp, No. 2,174,534, Oct. 3, 1939 (applied for Apr. 22, 1936); and Koch, No. 2,011,272 of August 13, 1935.

18. The prior art anti-perspirant solutions usually contain an acid salt of a heavy metal such as aluminum chloride or aluminum sulfate. The solutions were effective
269 for the purpose intended but after the application a residue of acid remained which sometimes irritated the skin and rotted fabrics contacted by it. This effect could be partly avoided by permitting the solution to dry and thereafter wiping it off with a damp cloth. This took time and could be troublesome for the user. The corrosive effect could be overcome by the addition of alkaline sub-

stances, but such a compound would be valueless as an anti-perspirant.

19. The problem to be solved as Wallace and Hand saw it, was to find a substance which, added to the solution or cream, would inhibit the corrosive effect when applied, but would not interfere with its anti-perspirant quality. They claimed to have found such a substance in certain amino compounds of which urea, specifically, is the one utilized in the accused composition. The article manufactured by Plaintiff under the patent known as Arrid, is a cream containing aluminum sulfate, the astringent, and urea, the corrosion inhibiting agent.

20. Defendant's product is a cream containing urea, aluminum sulfo-carbolate, aluminum sulfate, aluminum chloride and magnesium oxide. The three aluminum compounds are the astringents utilized.

21. The Defendant's product, known as Ever-Dry, responds to the claims in suit which are infringed if the patent is valid.

22. So far as the record shows, Wallace and Hand were the first persons to use urea as an agent for inhibiting the corrosive action of astringents in anti-perspirant preparations.

270 23. The prior patent to Schupphaus was for a method of preventing decomposition of nitro-compounds which were subject to decomposition when stored for a long period of time due to traces of acid or impurities of an unstable nature remaining in such compounds, in commercial manufacturing. Alkalis had been used to overcome this tendency but they had the effect of dissolving the product. Schupphaus suggested the use of urea as a neutralizer, which he had found effective.

24. This differs from the action of urea in the patented composition because the urea in the latter is used as a neutralizer while in the patented mixture, the acidity must be retained for the astringent, anti-perspirant action while the corrosive action on skin and clothes must be inhibited.

25. The patent to Missbach discloses the provision of an effective corrosion inhibitor to prevent damage to fabric in certain hydro-carbon compounds, such as carbon-tetrachloride, used in cleaning clothes. Missbach, for that purpose, suggests the use of (among other things) urea. Describing the inhibiting effect as accomplished by first neutralizing or removing any acid or acetic substances

present; second, by retarding the production of acid; and third, by forming a protective film on the surface of metal. We do not find anything in this patent that teaches that urea will inhibit the corrosive effect while leaving the solution sufficiently acid to be astringent.

26. The Shipp patent is different. It relates to the treatment of textiles, particularly cotton fabrics, with concentrated sulphuric acid. This acid is useful in pro-
271 ducing parchmentized effects and organdy finishes on cotton fabrics, but if such fabrics are immersed in 96% sulphuric acid at room temperature, removed immediately and rinsed immediately with a large volume of water, the fabric is disintegrated and destroyed. Shipp discovered that if as much as twenty-five parts by weight of urea were added to one hundred parts of acid, then a fabric might be treated with this solution up to sixty seconds without being appreciably tendered. This is quite like the effect produced by adding urea to a cream or solution containing aluminum chloride or aluminum which is to be applied to the skin or come in contact with the fabric. The urea was not used in the Shipp patent to neutralize the acid before it was necessary to get the effect of this acid in producing the desired finish. Urea was used not as a neutralizer, but as an inhibitor of corrosive action. If addition of urea to a 96% solution of sulphuric acid would retard the corrosive or degrading effect upon cotton fabric, it might well be thought it would inhibit the corrosive action on skin or fabric and the acid residue left on the skin after using the ordinary preparations containing aluminum sulfate or chloride.

27. Nothing but experimentation to be expected from skilled chemists was required to translate the disclosure of the corrosion inhibition of urea in the Shipp patent into the disclosure of the patent in suit for the inhibition of corrosive action of acid present in an anti-perspirant composition.

28. Certain of the defenses urged by Defendant in this action and not discussed by the Court in its original and supplemental opinions were deemed unnecessary to
272 be considered because of the finding of invalidity based on the disclosure of the Shipp patent.

Conclusions of Law.

A. This Court has jurisdiction of the parties hereto and of the subject matter of this cause.

B. Claims 1 to 6 inclusive, 8 to 13 inclusive, 15 and 16 of the Wallace *et al.* patent in suit are invalid as lacking patentable invention over the prior patent to Shipp, No. 2,174,534 of October 3, 1939 (application filed April 22, 1936), in that the patent in suit has merely adopted a substance, urea, for use in an anti-perspirant composition for the same fundamental purpose recognized and availed of by the prior patentee, Shipp.

C. Experimentation suggested by the disclosure of the Shipp patent which resulted in the formula of the patent in suit was not patentable.

D. In view of the invalidity of the claims of the patent in suit, Complaint must be dismissed as without equity.

Holly,
Judge, U. S. District Court.

October 1, 1946.

273 And on the same day to wit, on the 1st day of October, 1946, being one of the days of the regular September term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable William H. Holly District Judge, appears the following entry, to wit:

274 In the District Court of the United States.

* * (Caption—43-C-906) * *

JUDGMENT.

This cause having come on for trial on December 20, 1945, and having been heard upon depositions previously taken and upon proofs adduced in open court, upon oral arguments of the respective parties and upon briefs filed, in consideration thereof, it is ordered, adjudged and decreed as follows:

1. That this action arises under the Patent Laws of the United States, and this Court has jurisdiction of the parties and of the subject matter.

2. That the Letters Patent of Wallace and Hand, No. 2,236,387, issued March 23, 1941 for Perspiration Inhibiting Composition, charged by the Plaintiff to be infringed by the Defendant in the sale of a cream anti-perspirant, known as "Ever-Dry", manufactured by Ever-Dry Corporation, a corporation of the State of Nevada, and located at Los Angeles, California, are invalid for anticipation and lack of invention and that the action be, and hereby is dismissed for want of equity.

275 3. That the defense of this suit was taken over openly, and has been conducted wholly, by said Ever-Dry Corporation with the knowledge of this Court and of the Plaintiff.

4. That Defendant recover costs.

Holly,
U. S. District Judge.

Oct. 1st, 1946.

Approved as to form
Charles J. Merriam,
Solicitor for Plaintiff.

Thos. H. Sheridan,
Attorney for Defendant.

276 And afterwards on, towit, the 6th day of November, 1946 came the Plaintiff by his attorneys and filed in the Clerk's office of said Court his certain Notice Of Appeal in words and figures following, to wit:

277 UNITED STATES DISTRICT COURT,

Northern District of Illinois,

Eastern Division.

John H. Wallace, Jr., *Plaintiff*, *vs.* Mandel Brothers, Inc., a corporation, *Defendant.*	Civil Action No. 43 C 90(

NOTICE OF APPEAL.

Notice is hereby given that ~~John H.~~ Wallace, Jr., Plaintiff and Appelant, now appeals to the United States Circuit Court of Appeals for the Seventh Circuit from the Findings of Fact and Conclusions of Law and Judgment entered on October 1, 1946 as to all points covered therein and in favor of the Defendant, Appellee.

Chritton, Wiles, Schroeder, Merriam & Hofgren,

Attorneys for Plaintiff Appellant.

278 IN THE DISTRICT COURT OF THE UNITED STATES

For the Northern District of Illinois,

Eastern Division.

CERTIFICATE OF MAILING.

I, Roy H. Johnson, Clerk of the United States District Court, for the Northern District of Illinois, Eastern Division, keeper of the Seal and Records of said Court, do hereby certify that on the 6th day of November, 1946, in accordance with Rule 73(b) of the Rules of Civil Procedure for District Courts of the United States, I did cause to be mailed a copy of the foregoing Notice of Appeal to the following attorneys of record:

Taylor, Miller, Busch & Boyden,
134 S. LaSalle St.,
Chicago 3, Ill.

Sheridan, Davis & Cargill,
135 S. LaSalle St.,
Chicago 3, Ill.

Roy H. Johnson,
Clerk.

(Seal)

279 And on the same day, to wit, the 6th day of November, 1946 came the Appellant by his attorneys and filed in the Clerk's office of said Court his certain Statement Of Points On Appeal in words and figures following, to wit:

280 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

STATEMENT OF POINTS ON APPEAL.

The following errors are assigned by John H. Wallace, Jr., Plaintiff Appellant as a Statement of Points on which he intends to rely on said appeal.

1. The court erred in finding claims 1 to 6 inclusive, 8 to 13 inclusive and 15 and 16 of the Wallace et al. patent No. 2,236,387 invalid.

2. The court erred in finding said patent as lacking invention over the prior patent to Shipp No. 2,174,534.

3. The court erred in finding said Wallace patent No. 2,236,387 invalid for anticipation and lack of invention.

4. The court erred in dismissing plaintiff's complaint for want of equity.

5. The court erred in not finding said Wallace patent No. 2,236,387 valid and infringed by defendant in not assessing damages in favor of the plaintiff and against the defendant.

6. The court erred in entering the Findings of Fact and Conclusions of Law as to all points covered therein in favor of the defendant.

281 7. The court erred in not entering the following findings of fact proposed by plaintiff:

10. In spite of the fact that the effectiveness of anti-perspirants was due to their acidity, attempts were made in the past to overcome the acid corrosiveness of these materials by adding basic materials to neutralize the acid. One material employed was borax. The addition of bases or alkalis to the anti-perspirants did reduce the corrosiveness, but only at the expense of the astringency of the material. Corrosiveness could not be entirely removed without entirely removing astringency. There is no evidence that anyone now attempts to overcome the corrosiveness by such an expedient.

11. Urea is an organic compound which is neutral in its action. It was known for a long time that in spite of the neutral character of the urea under ordinary conditions it did have a reaction with acids and could be added to an acid, in the same manner as borax, to neutralize its acidity. There is no indication in the prior art, however, that urea had ever been added to a composition where acidity was necessary in order to maintain the acidity of the composition for one purpose and yet destroy the acidity of the composition for another.

Urea, when added to a solution of an acid-reactive salt like aluminum chloride, does not materially affect the acidity of the salt. In this it differs from alkalis like borax. This characteristic of urea is not shown in the prior art, nor could it have been known that the addition of urea to such a solution would leave its astringency unaffected.

Urea has the property, when added to an astringent

such as aluminum chloride or aluminum sulfate, of leaving the astringency and acidity thereof unaffected and at full potency while still inhibiting completely the corrosive effects of acid generated by action on the skin or by the heat of an iron. No alkali will do this. No previous use of urea accomplished an analogous result.

12. There was a long felt want for a non-corrosive anti-perspirant and particularly for a non-corrosive cream anti-perspirant. Wallace and Hand made both possible. The products "Arrid" and "Fresh" were both made under the patent in suit and had remarkable commercial success, an unprejudiced survey showing that in 1937 Arrid and Fresh together sold less than 5%, whereas by 1945 these two compositions accounted for over 45% of the total of anti-perspirants and deodorants. If de-
282 odorants are omitted from the computation, Arrid and Fresh accounted for almost the entire anti-perspirant market. Odorono, which was the leading anti-perspirant in 1937, then accounting for four times the combined volume of Fresh and Arrid, dropped to about one-eighth of their combined total in 1945. From a position of dominance in the anti-perspirant field, the leading competitor in 1937 had dropped to relative insignificance in a period of eight years. There is no evidence of any unusual amount of advertising by plaintiff's licensees.

13. The prior art relied upon by defendant comes from entirely unanalogous fields. No use of urea is shown which would teach one that it might possibly have the effect found in the patent in suit. The Koch patent which was most relied upon teaches the use of urea to prevent the decomposition of aluminum acetate and aluminum formate. It does not teach that urea will prevent corrosion nor is there any competent evidence that either aluminum acetate or aluminum formate is corrosive. The evidence shows that if the urea acted in the Koch process in the manner taught by Koch it would not be helpful in anti-perspirants.

Defendant relies upon an alleged prior public use by the patentees. This use consisted of the addition of urea to a resinous material prepared from cresol sulfonic acid. The evidence shows that no urea was present in the final cresol sulfonic acid resin product marketed by the patentees and also that in that product the urea acted to combine with the acid in the manner shown in the prior art, and not

as in the patent. In the cresol sulfonic acid product the combination of the urea and the resin product reduced the astringency of the product to such an extent that it was necessary to add an additional astringent in order that the product would be effective as an anti-perspirant.

14. This Court has considered carefully the decision of the Circuit Court of Appeals of the Second Circuit (133 Fed. 2-763) holding the patent in suit invalid. The records in the two suits are different and, on the basis of the present record, the bi-functionality of the urea which has been here demonstrated is not shown to be obvious from the prior art relied upon. The action of a cosmetic upon the skin likewise cannot be predicted from a knowledge of how the ingredients will act in the laboratory.

15. The patent is valid and infringed.

Chritton, Wiles, Schroeder, Merriam & Hofgren,
Attorneys for Plaintiff-Appellant.

Service of the above Statement of Points acknowledged this 6th day of November, 1946.

Sheridan, Davis and Cargill,
Attorneys for Defendant-Appellee.

283 And on the same day, to wit, the 6th day of November, 1946 there was filed in the Clerk's office of said Court a certain Appeal Bond in words and figures following, to wit:

284 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

APPEAL BOND.

Know All Men By These Presents: That John H. Wallace, Jr., of Chicago, Illinois, as principal, and American Surety Company of New York, as surety, are held and firmly bound unto Mandel Brothers, Inc., an Illinois corporation, of Chicago, Illinois, in the full and just sum of Two Hundred and Fifty Dollars ($250.00), to be paid to the said Mandel Brothers, Inc., its successors or assigns, to which payment well and truly to be made, we bind our-

elves, assigns, and successors, jointly and severally, firmly
y these presents.

Sealed with our seals and dated this 31st day of Octo-
er, A. D. 1946.

Whereas, lately, at a session of the District Court of
he United States for the Northern District of Illinois,
Eastern Division, in a suit pending in said Court between
he defendant, Mandel Brothers, Inc., and the plaintiff,
ohn H. Wallace, Jr., a final decree was entered against
he said plaintiff, and the plaintiff, John H. Wallace, Jr.,
s herewith filing his Notice of Appeal to the United
States Circuit Court of Appeals for the Seventh Circuit:

Now, the condition of this obligation is such, that
85 if the said plaintiff, John H. Wallace, Jr., shall prose-
cute its said appeal to effect and shall answer all costs
hat may be awarded if it fails to make its appeal good,
hen this obligation to be void; otherwise to remain in
ull force and effect.

John H. Wallace, Jr.,
Chritton, Wiles, Schroeder, Merriam
& Hofgren,
By: Chritton, Wiles, Schroeder, Mer-
riam & Hofgren,

Attorneys.

American Surety Company of New York,
By: B. H. Davenport,

ttest:
G. Hoffman.

G. Hoffman,
(Seal) *Res. Ass't Sec'y.*

286 And on the same day to wit, the 6th day of November, 1946 came the Appellant by his attorneys and filed in the Clerk's office of said Court his certain Designation of Contents of Record on Appeal in words and figures following, to wit:

287 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

DESIGNATION OF CONTENTS OF RECORD ON APPEAL.

Plaintiff, John H. Wallace, Jr., herewith designates the following as those portions of the record and proceedings herein which he deems should be contained in the Record on Appeal of this cause to the United States Circuit Court of Appeals for the Seventh Circuit.

1. Complaint.
2. Stipulation filed June 29, 1945.
3. Defendant's amended answer.
4. Amendment to defendant's answer filed March 3, 1946.
5. Memorandum opinion of the District Court filed June 25, 1946.
6. Supplemental memorandum opinion of the District Court filed September 18, 1946.
7. Findings of Fact and Conclusions of Law and Decree entered October 1, 1946.
8. Plaintiff's Exhibits 1, 2 and 8.
9. The following portion of plaintiff's Exhibit 15: page 26 of Dell Modern Magazines' Fourteenth Survey of Beauty—1945.
10. The following portions of the typewritten transcript of proceedings:

Page 1;

Page 12 to and including line 5, page 38;

From last line, page 38 to bottom page 41;

288 Page 49 to and including line 1, page 53;

From line 21, page 57 to page 87, inclusive;

From line 22, page 97 to page 199 line 3, inclusive;

11. Notice of Appeal.

12. Statement of Points on Appeal.
13. Bond.
14. Designation of Contents of Record on Appeal.
15. Stipulation as to Physical Exhibits.

Chritton, Wiles, Schroeder,
Merriam & Hofgren,
Attorneys for Plaintiff-Appellant.

Service of the above Designation of Contents of Record on Appeal acknowledged this 6th day of November, 1946.

Sheridan, Davis and Cargill,
Attorneys for Defendant-Appellee.

289 And on the same day to wit, the 6th day of November, 1946 came the Appellant by his attorneys and filed in the Clerk's office of said Court his certain Amended Designation of Contents of Record on Appeal in words and figures following, to wit:

290 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

AMENDED DESIGNATION OF CONTENTS OF RECORD ON APPEAL.

Plaintiff, John H. Wallace, Jr., herewith designates the following as those portions of the record and proceedings herein which he deems should be contained in the Record on Appeal of this cause to the United States Circuit Court of Appeals for the Seventh Circuit.

1. Complaint.
2. Stipulation filed June 29, 1945.
3. Defendant's amended answer.
4. Amendment to defendant's answer filed March 3, 1946.
5. Memorandum opinion of the District Court filed June 25, 1946.
6. Supplemental memorandum opinion of the District Court filed September 18, 1946.
7. Findings of Fact and Conclusions of Law and Decree entered October 1, 1946.

8. Plaintiff's Exhibits 1, 2 and 8.

9. The following portion of plaintiff's exhibit 15: page 26 of Dell Modern Magazines' Fourteenth Survey of Beauty—1945.

10. Defendant's Exhibit F being a patent to Schupphaus.

11. Defendant's Exhibit G being a patent to Missbach.

12. Defendant's Exhibit H being a patent to Shipp.

291 13. Defendant's Exhibit I being a patent to Koch.

14. The following portions of the typewritten transcript of proceedings:

Page 1;

Page 12 to and including line 5, page 38;

From last line, page 38 to bottom page 41;

Page 49 to and including line 1, page 53;

From line 21, page 57 to page 87, inclusive;

From line 22, page 97 to page 199 line 3, inclusive;

15. Notice of Appeal.

16. Statement of Points on Appeal.

17. Bond.

18. Amended Designation of Contents of Record on Appeal.

19. Stipulation as to Physical Exhibits.

Chritton, Wiles, Schroeder,
Merriam & Hofgren,
Attorneys for Plaintiff-Appellant.

Service of the above Amended Designation of Contents of Record on Appeal acknowledged this 6th day of November, 1946.

Sheridan, Davis and Cargill,
Attorneys for Defendant-Appellee.

292 And afterwards on, to wit, the 7th day of November, 1946 came the Appellee by its attorneys and filed in the Clerk's office of said Court its certain Supplemental Designation of Contents of Record on Appeal in words and figures following, to wit:

293 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

SUPPLEMENTAL DESIGNATION OF CONTENTS OF RECORD ON APPEAL.

Defendant, Mandel Brothers, Inc. herewith designates the following as portions of the record which it deems should be added to the portions designated by Plaintiff to be contained in the Record on Appeal of this cause to the U. S. Circuit Court of Appeals for the Seventh Circuit.

(1) The following portions of the typewritten transcript of proceedings:

Line 6 to the last line, page 38;

Page 53, line 2, to and including line 20, page 57;

Page 93, line 4, to and including line 21, page 97.

(2) Defendant's Exhibits A and B (marked for identification).

Sheridan, Davis and Cargill,
Attorneys for Defendant-Appellee.

Service of the above Supplemental Designation of Contents on the Record on Appeal acknowledged this 7th day of November, 1946.

Charles J. Merriam,
Attorneys for Plaintiff-Appellant.

294 And on the same day to wit, the 6th day of November, 1946 came the Parties by their attorneys and filed in the Clerk's office of said Court their certain Stipulation as to Physical Exhibits in words and figures following, to wit:

295 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

STIPULATION AS TO PHYSICAL EXHIBITS.

It is stipulated between the parties herein, by their respective attorneys, that the following original exhibits introduced on the trial of this cause may be transmitted to the Circuit Court of Appeals for the Seventh Circuit in lieu of the reproduction of the said exhibits as a part of the printed record on appeal:

1. Plaintiff's Exhibit 3, a sample of the product "Arrid" admitted on page 12;

Plaintiff's Exhibit 4, being a sample of "Odorono" admitted on page 14;

Plaintiff's Exhibit 5, being a sample of "Mum" admitted on page 15;

Plaintiff's Exhibit 6, being a sample of "Ever-Dry" admitted on page 15;

Plaintiff's Exhibit 7, being a sample of "Fresh" admitted on page 16;

Plaintiff's ~~Exhibit 9,~~ being a printed record in *Wallace v. Woolworth*, admitted on page 14;

Plaintiff's Exhibits 12, 13 and 14 being samples of cloth, admitted on pages 24, 25 and 26; and

Plaintiff's Exhibit 15 being a survey of sales admitted on page 41, except page 26 of Dell Modern Magazine's Fourteenth Survey of Beauty 1945, which is being printed as a part of the transcript.

296 2. Defendant's Exhibit D and Defendant's Exhibit J being pages from the Chemistry of Urea, admitted on page 98;

Defendant's Exhibits K, L, M, N, O, P, Q, R and S being samples of cloth admitted on pages 114, 119, 124, 125, 126, 127 and 128.

Said exhibits shall be transmitted by the clerk of this court to the said Circuit Court of Appeals for the Seventh Circuit with the record on appeal on this cause and when the appeal on this cause shall be heard and determined, said exhibits shall be returned to this court by the clerk of the Circuit Court of Appeals for the Seventh Circuit.

Chritton, Wiles, Davies, Schroeder & Merriam,
Attorneys for Plaintiff-Appellant.

Sheridan, Davis and Cargill,
Attorneys for Defendant-Appellee.

Approved:
Holly,
U. S. District Judge.

297 And on the same day to wit, on the 6th day of November, 1946, being one of the days of the regular November term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable William H. Holly District Judge, appears the following entry, to wit:

298 In the District Court of the United States.
* * (Caption—43-C-906) * *

Wednesday, November 6, 1946.

Present: Honorable William H. Holly, District Judge.

On stipulation of the parties by their attorneys filed herein

It Is Ordered that the Clerk of this Court include as part of the record herein on appeal the original exhibits indicated in said stipulation.

299 And afterwards on, to wit, the 13th day of November, 1946 came the Parties by their attorneys and filed in the Clerk's office of said Court their certain Stipulation in words and figures following, to wit:

300 UNITED STATES DISTRICT COURT.

(Caption—43-C-906)

STIPULATION.

It is hereby stipulated and agreed by and between the parties hereto, by their respective attorneys, as follows:

1. That Defendant's Motion for Leave to Amend its Amended Answer, which motion was filed on January 3, 1946, stand as the Amendment to Defendant's Amended Answer, designated in Plaintiff's Designation for Contents of Record on Appeal as filed on March 3, 1946, and that the same may be included in the Record on Appeal.

2. That Plaintiff's exhibit 2 is page 151 of Plaintiff's exhibit 9, being the printed record in the case of *Wallace v. Woolworth*.

3. That this stipulation may be included in the Record on Appeal.

Chritton, Wiles, Schroeder, Merriam & Hofgren,
Attorneys for Plaintiff-Appellant.

Sheridan, Davis and Cargill,
Attorneys for Defendant-Appellee.

301 And on the same day, to wit, on the 13th day of November, 1946, being one of the days of the regular November term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable William H. Holly, District Judge, appears the following entry, to wit:

302 IN THE DISTRICT COURT OF THE UNITED STATES.

(Caption—43-C-906)

Wednesday, November 13, 1946.

Present: Honorable William H. Holly, District Judge.

Come the parties to this suit by their attorneys, respectively, and present to the Court for approval their stipulation identifying Plaintiff's Exhibit No. 2 and specifying additional matter to be included in the Record on Appeal herein to the United States Circuit Court of Appeals for the Seventh Circuit, and, the Court having considered said stipulation and being fully advised in the premises,

It Is Ordered that said stipulation be and it is hereby approved.

303 And afterwards, to wit, on the 22nd day of November, 1946, being one of the days of the regular November term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable William H. Holly, District Judge, appears the following entry, to wit:

304 IN THE DISTRICT COURT OF THE UNITED STATES.

(Caption—43-C-906)

Friday, November 22, 1946.

Present: Honorable William H. Holly, District Judge.

On agreement of the parties to this suit by their attorneys now made in open Court

It Is Ordered that the Clerk of this Court may transmit to the Clerk of the Circuit Court of Appeals for the Seventh Circuit all original exhibits as designated to be included in the Record on Appeal.

Patented May 25, 1941

Wallace E.1 167

12/6/06 GAN

2,236,387

UNITED STATES PATENT OFFICE

2,236,387

PERSPIRATION INHIBITING COMPOSITION

John H. Wallace, Jr., Princeton, N. J., and Wilfred C. Hand, New York, N. Y.; said Hand assignor to said Wallace, Jr.

No Drawing. Application May 3, 1938, Serial No. 205,702

16 Claims. (Cl. 167—90)

This invention relates to improved perspiration retarding or inhibiting compounds.

It has heretofore been proposed to control or retard the flow of perspiration from certain skin areas by the application of solutions containing an acid salt of a heavy metal, usually aluminum chloride or aluminum sulfate. Such solutions are effective in stopping perspiration but are unsatisfactory and hazardous in that the use thereof frequently produces acute skin irritation or dermatitis and rots clothing fabrics which come in contact with the treated areas. In an attempt to mitigate the corrosive action of these compounds on fabrics, directions for their use usually urge that the solutions be permitted to dry on the skin and that the treated skin areas be thereafter wiped off with a damp cloth before clothing is brought in contact therewith. The solutions dry slowly and these precautions are frequently disregarded. In any case, the recommended procedure does not prevent skin irritation.

Prior to the present invention, the above described corrosive action of effective perspiration inhibiting preparations was considered inherent and unavoidable. The action of such preparations apparently depends upon the presence of both the metallic aluminum or aluminum hydroxide ion and the strong mineral acid ion. Considering aluminum sulfate, for example, the aluminum or aluminum hydroxide ion apparently combines with and coagulates the skin proteins only in the presence of the sulfate radical, and as a result of this action, a residue of sulfuric acid remains which irritates the skin and rots the clothing. The use of metallic salts of weak acids offers no solution since such compounds are ineffective to restrict the flow of perspiration. The problem is further complicated by the fact that if alkaline substances are added, insoluble basic aluminum compounds, such as aluminum hydroxide, are formed, and no perspiration retarding action is obtained. As a consequence, all previously known effective perspiration inhibiting preparations are characterized by the above described undesirable corrosive action.

With the above and other considerations in mind, it is proposed in accordance with the present invention to provide an improved perspiration retarding or inhibiting compound which, while retaining in full the desirable inhibitory action of previously known preparations, avoids their corrosive action and is harmless to the skin and fabrics. Other objects of the invention include the provision of a perspiration treating or inhibiting compound which is inexpensive to produce, which may be easily applied in liquid, semi-liquid or other forms and which has no undesirable odor or other physical or chemical properties which would impair its usefulness as a cosmetic preparation.

The objects of the invention are carried out by providing a compound in which are combined one or more water soluble heavy metal salts of strong acids, usually mineral acids, and a normally neutral water soluble amino compound possessing one or more intact reactive amino (NH_2) groups.

The metallic salt astringent or coagulant ingredient of our composition preferably comprises a water soluble strong acid salt of one or more metals, such as aluminum, zinc, cerium, zirconium, titanium, iron or bismuth, although salts of tin, lead and cadmium are also effective. The acid radical of the astringent salt is preferably chosen from the mineral acid group, such as sulfuric, phosphoric or hydrochloric acid, although salts of strong organic acids, such as sulfonic acids, may also be used. Examples of water soluble heavy metal salts which give excellent results are aluminum sulfate, aluminum chloride and aluminum phosphate.

The normally neutral protective ingredient of our composition is preferably a chemical selected from one of two groups of amino compounds, namely the amides and the amino acids. The suitable chemicals in these groups are those which are neutral, which are materially soluble in water or in the strong acid salt of the heavy metal comprising the astringent ingredient of our composition, and which possess one or more intact amino groups. Examples of amides which are suitable for use as the protective ingredient of our composition are the lower aliphatic and aromatic amides, such as formamide, acetamide, carbamide (urea) and derivatives thereof. Suitable derivatives of carbamide include those obtained by replacing one amino group thereof with an alkyl, acyl, or aryl group, such as ethyl carbamate, and those derived by the replacement of one or more hydrogen atoms of one amino group of carbamide, such as ethyl urea and methyl urea. Another suitable derivative of carbamide is one in which both amino groups are intact and oxygen has been replaced by sulfur.

Examples of amino acids which are suitable for use in our composition as the protective ingredient thereof are aminoacetic acid and aminopropionic acid.

We find it preferable to combine the acid salt

305

ingredient and the normally neutral ingredient in such proportions that one reactive amino group of the protective ingredient is available for each potential acid ion of the salt. For example, if the astringent and protective ingredients comprise aluminum sulfate and glycine (aminoacetic acid) respectively, the proportions of these ingredients should be such that six molecules of glycine are provided for each molecule of the salt, since upon hydrolysis, a molecule of aluminum sulfate produces three molecules of dibasic sulfuric acid. If urea (carbamide) is used as the protective ingredient with aluminum sulfate, the proportions should be such as to provide six molecules of urea for each molecule of aluminum sulfate, since although each molecule of urea contains two amino groups, only one of them is chemically active in this reaction.

A specific example of our improved composition using aluminum sulfate and urea may be prepared by dissolving 25 grams of aluminum sulfate in approximately 50 cubic centimeters of water and adding and dissolving 15 grams of urea in such solution, the volume of the solution being finally brought up to 100 cubic centimeters by the addition of water.

An example of the composition employing an amino acid as the protective ingredient may be prepared by dissolving 13 grams of aluminum sulfate in about 20 cubic centimeters of water and dissolving 9 grams of glycine (aminoacetic acid) in such solution.

The above and other solutions of our composition may be used in the form described or a suitable wetting agent may be added thereto if desired. Our improved compound may also be incorporated in an emulsion with wax or oil and applied to the skin in this form.

Our improved composition is highly effective in stopping perspiration and is harmless to the skin and fabrics. It is our belief that when the composition is applied to the skin, the ionized metallic salt gives up metallic ions or metallic hydroxide ions which combine with the skin proteins to form coagulant materials and so inhibit the flow of perspiration. The acid ions present make possible this coagulating action, probably either acting as solubilizing agents or reacting with the skin proteins. The reaction of the metallic ions with the skin proteins leaves an excess of sulfuric acid which immediately reacts with the normally neutral protective ingredient, probably forming a neutral addition compound therewith through the reactive amino groups thereof. Although we believe that the foregoing explanation is correct, it should be understood that the invention is in no way dependent upon the accuracy of the theory here expressed.

We claim:

1. A perspiration inhibiting composition comprising a non-toxic water soluble protein coagulating metallic salt of a strong acid and a neutral, water soluble amino compound taken from the group consisting of the aliphatic amides and the aliphatic amino acids and having at least one intact, reactive amino group.

2. A perspiration inhibiting composition comprising a solution of aluminum sulfate and a normally neutral amino compound, soluble in said salt solution, taken from the group consisting of the aliphatic amides and the aliphatic amino acids and having at least one intact, reactive amino group.

3. A perspiration inhibiting composition comprising a solution of aluminum sulfate and a normally neutral water soluble aliphatic amide having at least one intact, reactive amino group.

4. A perspiration inhibiting composition comprising a solution of aluminum sulfate and a normally neutral water soluble aliphatic amino acid having at least one intact, reactive amino group.

5. A perspiration inhibiting composition comprising a solution of aluminum sulfate and urea.

6. A perspiration inhibiting composition comprising a non-toxic water soluble protein coagulating metallic salt of a strong acid and a normally neutral water soluble organic compound taken from the group of amino compounds consisting of the aliphatic amides and the aliphatic amino acids and having at least one intact, reactive amino group, the proportion of said organic compound in the composition being sufficient to provide at least one intact, reactive amino group for each potential acid ion of the metallic salt.

7. A perspiration inhibiting composition comprising a water solution containing a solute comprising about 62% by weight of aluminum sulfate and about 38% by weight of urea.

8. A cosmetic astringent preparation containing an astringent material comprising an acid-reacting inorganic salt of a polyvalent metal and a proportion of a soluble aliphatic amide.

9. A cosmetic astringent preparation including aluminum chloride and a soluble aliphatic amide.

10. A cosmetic astringent preparation including aluminum chloride and urea.

11. A cosmetic astringent preparation including as its essential astringent ingredient an acid reacting inorganic salt of a polyvalent metal together with a proportion of a water soluble aliphatic amide.

12. A cosmetic astringent preparation including aluminum sulphate as its essential astringent ingredient together with urea.

13. A cosmetic astringent preparation containing an astringent material comprising an acid reacting inorganic salt of a polyvalent metal and a proportion of urea.

14. A cosmetic astringent preparation containing an astringent material comprising an acid reacting inorganic salt of a polyvalent metal and a proportion of a water soluble aliphatic amino acid.

15. A cosmetic astringent preparation containing aluminum sulphate as its essential astringent ingredient together with a soluble aliphatic amide.

16. A cosmetic astringent preparation containing as its essential astringent ingredient an acid reacting inorganic salt of a polyvalent metal together with a proportion of urea.

JOHN H. WALLACE, Jr.
WILFRED C. HAND.

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UNITED STATES PATENT OFFICE.

ROBERT C. SCHÜPPHAUS, OF BROOKLYN, NEW YORK.

NITRO COMPOUND AND PROCESS OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 514,838, dated February 13, 1894.

Application filed July 11, 1893. Serial No. 480,192. (No specimens.)

To all whom it may concern:

Be it known that I, ROBERT C. SCHÜPPHAUS, a citizen of the United States, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Method of Securing the Chemical Stability of Nitro Compounds, of which the following is a specification.

The object of my invention is to produce a method of preventing the decomposition or of securing the chemical stability of nitro-compounds, it being a well-known fact that such compounds when stored for a long period of time often undergo decomposition which, slight at first, gradually increases until the whole compound has become more or less decomposed and otherwise chemically changed.

The nitrates of polyatomic alcohols such as glycerine and mannite and of related compounds as the carbohydrates for example starch, cellulose and the like, are especially susceptible to decomposition unless they are produced in an absolutely pure state, which is seldom the case in manufacturing these compounds for commercial use; and whenever traces of acid or of impurities of an unstable character remain in the finished product, decomposition always occurs after the lapse of a more or less short period of time. To prevent this decomposition in the finished product of nitro-compounds, various means have been devised and employed as in the manufacture of gun cotton or nitro-cellulose, it is not unusual to incorporate a small quantity of an alkaline substance, such as silicate of soda, to the compound in course of its manufacture to prevent its decomposition; and in the manufacture of dynamite it is not unusual to add carbonate of lime or magnesia for the same purpose; and in the manufacture of pyralin, celluloid, zylonite and similar compounds of pyroxyline and camphor, carbonate of magnesia is frequently added during the process of manufacture. In preparing high explosives diphenylamine and aniline are employed to prevent decomposition which is particularly destructive of the effectiveness of such explosives, and as they are capable of complete combustion they increase the volume of gases produced and moreover leave no residue. In addition to the fact that these compounds with nitrous acid, which is a constant product of the decomposition of these nitro derivatives, are themselves unstable in character, their introduction in many cases is inadmissible because of the discoloration which they are apt to produce.

All of the above mentioned difficulties and many others are overcome by the use of urea or carbamide as a neutralizer, which substance I have discovered is an effectual neutralizer of impurities in nitro-compounds and absolutely prevents their decomposition.

In practice the nitro-compounds are freed as far as possible from all adherent acids by repeated washings, and they are subsequently dried, if necessary, after which I add the urea in suitable proportions according to the quantity of nitro-compound and the purpose for which the finished product is intended to be used, the urea itself being dissolved in a stable menstruum or flux compatible with the solvents employed in the respective manufactures of nitro-compounds which solvents are usually methyl or ethyl alcohol. As above stated the quantity of urea which is mixed with the compound is regulated by the conditions above-mentioned and varies from one half per cent. (½%) to two per cent. (2%). This solution of urea and solvent penetrates every particle of the nitro-compounds and neutralizes any acids or other impurities that may be present while the surplus remains evenly distributed throughout the whole mass. The complete neutralization thus attained is an absolute safe-guard against decomposition, but should however any part of the mass be subjected to disturbing influences of any character and decomposition set in the additional quantity or surplus of the "neutralizer," which as stated remains evenly distributed throughout the whole mass counteracts this incipient decomposition and prevents its spreading. The acids which have to be neutralized in such compounds are sulphuric, nitric and nitrous acids which may be found in faint traces in the adherent wash-water. As the nitrate and sulphate of urea are perfectly stable and colorless substances the product resulting from its use with nitro-compounds becomes absolutely stable, and no discoloration whatever occurs as with the use of the

substances heretofore added to prevent the decomposition of the nitro-compounds as above-mentioned. Furthermore as nitrous acid reacts with urea in a remarkable manner, yielding carbonic acid, nitrogen and water, any nitrous acid that may be present or become generated during the process of manufacture is thereby rendered absolutely harmless. As urea requires a minimum of oxygen to effect complete combustion it is a perfect neutralizer in the manufacture of high explosives and owing to its low molecular weight a smaller quantity will neutralize a given amount of free acid than any other organic base heretofore used for the same or similar purposes.

I do not limit myself to the quantity of urea or carbamide which may be introduced into the nitro-compounds for the purpose above stated, since as above mentioned the quantity of urea will vary according to the character of the nitro-compound and the purpose for which the resulting product is to be used; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In the process of securing the chemical stability of nitro-compounds, the improvement which consists in adding to or incorporating therewith urea, as set forth.

2. As a new article of manufacture an explosive compound, composed of a nitro-compound having urea incorporated therewith, as set forth.

3. As a new article of manufacture, a pyroxyline composition having urea incorporated therewith, as set forth.

This specification signed and witnessed this 2d day of December, A. D. 1892.

ROBERT C. SCHUPPHAUS.

In presence of—
M. GIBSON,
E. M. TAYLOR.

Patented Aug. 13, 1935 2,011,292

UNITED STATES PATENT OFFICE

2,011,292

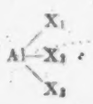
PREPARATIONS CONTAINING ALUMINIUM ACETATE AND ALUMINIUM FORMATE

Ernst Koch, Frankfort-on-the-Main, Germany, assignor to General Aniline Works, Inc., New York, N. Y., a corporation of Delaware

No Drawing. Application September 11, 1934, Serial No. 743,619. In Germany September 16, 1933

10 Claims. (Cl. 23—250)

I have found that stable solutions of aluminium acetate or aluminium formate may be obtained by adding to solutions of neutral or basic aluminium acetate or formate of the following general formula:



wherein X_1 stands for —OOCH or —OOC.CH_3 and X_2 and X_3 stand for —OH or —OOCH or —OOC.CH_3, urea or thiourea or derivatives thereof, such as N-alkyl or aliphatic N-acyl derivatives of urea and thiourea, for instance, methyl-, ethyl-, propyl-, symmetrical and asymmetrical dimethyl-, diethyl- and dipropyl-urea and -thiourea, formyl-, acetyl-, diacetyl-, chloroacetyl-, methylacetyl-, oxalyl-, malonyl-urea, acetyl thiourea etc. and salts of urea with aliphatic dicarboxylic acids, such as salts of urea with oxalic acid, malonic acid, succinic acid, fumaric acid, maleic acid, malic acid, tartaric acid, citric acid, or mixtures of these substances.

The quantity of the adjuvants depends on the concentration of the solution. In the case of a solution of an aluminium salt of specific gravity 1.09 there must be added, for instance, about 5–15 grams of the adjuvant per kilogram.

The solutions thus obtained are stable in the different merchantable concentrations for an unlimited time. They may be evaporated to dryness without decomposition of the aluminium salts so that solid water soluble aluminium acetate or formate may be obtained. The solid salts dissolve entirely in water even after a long storage without any decomposition of the aluminium salts.

The solutions of these products may be used with special advantage in the textile industry because they do not contain any substances which would have a detrimental effect when used, for instance, for impregnation purposes.

The following examples serve to illustrate the invention but they are not intended to limit it thereto, the parts being by weight unless otherwise stated:

1. In 1000 parts of a solution of aluminium formate of specific gravity 1.09 there are dissolved 8 parts, i. e. 0.8 per cent, of urea. The solution thus obtained is stable for an unlimited time. If the solution is evaporated to dryness a white powder is obtained which contains about 8 per cent of urea. The dry aluminium formate is water-soluble even after a long storage.

2. To a solution of 1000 parts of aluminium acetate of specific gravity 1.05 there are added 12 parts, i. e. 1.2 per cent, of thiourea. If the solution which may be stored for an unlimited time is evaporated in a vacuum there is obtained after drying a white non-hygroscopic salt which contains about 12 per cent of thiourea and dissolves in water even after a long storage without any residue.

3. In a solution of 1000 parts of aluminium acetate of specific gravity 1.062 there are dissolved 12 parts, i. e. 1.2 per cent. of urea oxalate. From the solution thus obtained there separates no water-insoluble basic aluminium acetate even after a long storage. This would, however, be the case if urea oxalate had not been added. When the solution is evaporated to dryness a white powder is obtained which contains about 12 per cent of urea oxalate.

4. To a solution of 1000 parts of aluminium formate of specific gravity 1.086 there are added 6 parts of thiourea, i. e. 0.6 per cent, 4 parts of urea, i. e. 0.4 per cent, and 4 parts of formylurea, i. e. 0.4 per cent. If the solution, which may be stored for an unlimited time, is evaporated in a vacuum and dried a stable white salt is obtained which is completely soluble in water.

I claim:

1. An aqueous stable solution of an aluminium salt of the general formula:

wherein X_1 stands for —OOCH or —OOC.CH_3 and X_2 and X_3 stand for —OH or —OOCH or —OOC.CH_3, containing at least one compound selected from the group consisting of urea, thiourea, N-alkyl and aliphatic N-acyl derivatives of these compounds, and salts of urea with aliphatic dicarboxylic acids in which solutions the aluminium salts do not decompose and which solutions are capable of being evaporated to dryness to form solid stable preparations dissolving in water without decomposition of the aluminium salts.

2. An aqueous stable solution of aluminium formate containing urea, in which solution the aluminium salt does not decompose and which solution is capable of being evaporated to dryness to form a solid stable preparation dissolving in water without decomposition of the aluminium salt.

3. An aqueous solution of aluminium formate of specific gravity 1.09 containing 0.8 per cent of urea in which solution the aluminium salt does not decompose and which solution is capable of being

evaporated to dryness to form a solid stable preparation dissolving in water without decomposition of the aluminium salt.

4. An aqueous solution of aluminium acetate containing thiourea, in which solution the aluminium salt does not decompose and which solution is capable of being evaporated to dryness to form a solid stable preparation dissolving in water without decomposition of the aluminium salt.

5. An aqueous solution of aluminium acetate of specific gravity 1.05 containing 1.2 per cent of thiourea, in which solution the aluminium salt does not decompose and which solution is capable of being evaporated to dryness to form a solid stable preparation dissolving in water without decomposition of the aluminium salt.

6. Solid stable preparations obtainable by evaporating to dryness the solutions of claim 1, dissolving in water without decomposition of the aluminium salts.

7. A solid stable preparation obtainable by evaporating to dryness the solution of claim 2, dissolving in water without decomposition of the aluminium salt.

8. A solid stable preparation obtainable by evaporating to dryness the solution of claim 3, dissolving in water without decomposition of the aluminium salt.

9. A solid stable preparation obtainable by evaporating to dryness the solution of claim 4, dissolving in water without decomposition of the aluminium salt.

10. A solid stable preparation obtainable by evaporating to dryness the solution of claim 5, dissolving in water without decomposition of the aluminium salt.

ERNST KOCH.

MICRO
TRADE
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MATTHEW BENDER & COMPANY
MB

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Patented Feb. 2, 1937

2,069,711

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UNITED STATES PATENT OFFICE

2,069,711

STABILIZED CARBON TETRACHLORIDE

Edmund C. Missbach, Oakland, Calif., assignor to Stauffer Chemical Company, a corporation of California

No Drawing. Original application January 23, 1935, Serial No. 3,182, which in turn is a division of Serial No. 692,819, October 9, 1933. Divided and this application April 10, 1936, Serial No. 73,714

2 Claims. (Cl. 23—250)

This invention relates to the prevention of decomposition of halogenated hydrocarbon compounds, particularly chlorinated aliphatic hydrocarbons, and to the prevention of corrosion by these compounds. It is known that these materials when exposed to moisture, light, air, and heat, particularly during distillation, as in the case of carbon tetrachloride, decompose with the formation of substances of an objectionable character, usually acidic substances which render the material unsuitable for such purposes as extractions as well as corroding equipment. The decomposition I attribute to hydrolysis and liberation of acid or acid bodies which also catalyze the decomposition.

Examples of materials with which the present invention is concerned are carbon tetrachloride, CCl_4, chloroform, $CHCl_3$, trichlorethylene, C_2HCl_3, tetrachlorethylene, C_2Cl_4, pentachlorethylene, C_2HCl_5, and the like. Generally, it is concerned with chlorinated and brominated derivatives of methane, ethane, and higher paraffins, as well as ethylene and higher homologues thereof.

The object of this invention is to provide an effective stabilizer for chlorinated hydrocarbons which need be used only in relatively small concentrations, in effect a negative catalyst for decomposition.

Another object of this invention is to provide an effective corrosion inhibitor for use in the presence of halogenated hydrocarbons.

I have found that numerous compounds hereinafter set forth are effective stabilizers and corrosion inhibitors for these materials. Of course, one inhibitor may not be practical for reasons other than its corrosion inhibiting properties and choice must be exercised to the end in view. For example, an inhibitor in carbon tetrachloride to be used in dry cleaning clothes must not deleteriously affect fabrics to be cleaned or alter the color thereof.

The corrosion inhibitor used need only be present in a relatively small concentration, usually a small fraction of 1%, and compounds of relatively low solubility in the halogenated hydrocarbon have been used effectively. In some cases, where it is desired to use relatively large quantities of the inhibitor, and where the water solubility of the corrosion inhibitor is relatively greater than its solubility in the compound, the inhibitor may be introduced in the form of an aqueous solution. Such a mixture is effective particularly during distillation, by stabilizing the halogenated hydrocarbon in its liquid state as well as in the vapor phase, a sufficient amount of the inhibitor being volatile with the water vapor. By stabilizing amount I refer to a quantity of the order of 1% and less and capable of stabilizing effectively the material.

In cases where the solubility of the corrosion inhibitor in the halogenated hydrocarbon compound is relatively very small, it has been found that the efficiency of these particular inhibitors is so great, that only very small quantities of same are required to stabilize the halogenated hydrocarbon compound to the extent demanded in practice. If it is desired to apply larger proportional amounts of an inhibitor of a solid type, it is reduced to a fine powder, and suspended in the halogenated hydrocarbon, which procedure is especially advisable in case of recovering the halogenated hydrocarbon by distillation.

In some other cases, where it is desired to increase the concentration of the inhibitor above its solubility in the halogenated compound, it is dissolved in a solvent compound miscible with the halogen compound and then incorporated. As suitable solvents, I have used the following compounds: Ethylal, methylal, n-butyl alcohol, n-propyl alcohol, methyl ethyl ketone, allyl alcohol, allylethyl ether, methyl carbonate, ethyl carbonate, ethyl oenanthate, beta dimethylamino-ethyl alcohol, n-heptaldehyde, and polymerized castor oil. In the case of polymerized castor oil, this material appears to have a metal protecting action and reduces the rate of corrosion apparently by forming a protecting film on the metal.

In all cases, where the corrosion inhibitors mentioned are in the form of solid substances, or are liquids at atmospheric temperatures, and have boiling points considerably higher than that of the halogenated hydrocarbon, they are sufficiently volatile with the water vapor escaping together with the vapor of the halogenated hydrocarbon during distillation. They are therefore not only capable of protecting the latter in the liquid phase, but also in the vapor phase, as have been sufficiently demonstrated by accelerated corrosion tests made in behalf of these corrosion inhibitors, and conducted continuously for a period of 168 hours under reflux in the presence of water, as well as by use for several years under conditions met in practice with carbon tetrachloride.

This case is a division of my case 3,182 filed January 23, 1935, which in turn is a division of my case 692,819, filed October 9, 1933, which are incorporated by reference. In this case I claim a group of compounds which can be considered as derived from urea, termed ureides.

Amides of carbonic acid, normal and acid, as carbamide (urea) and carbamic acid, and derivatives of imido-carbonic acid, are useful as are urethane, ethylimido-dicarboxylate, biuret, urils as diurea, and semi-carbazide or semi-hydrocarbazide, as well as o-phenetyl urea. Alkylated ureas are also useful as the methyl-, ethyl-, and sym.-diethyl, and unsym.-diethyl ureas. Purine, a complex cyclic diureide is included.

Amidines of carbonic acid as guanidine, the isolog of urea and its derivatives, guanidine carbonate, amino-guanidine, as well as glycocyamine, glyco-cyamidine, creatine and creatinine are included.

The stabilizing effect and inhibiting action in corrosion of my inhibitor toward decomposition of the halogen content is, I believe, accomplished thus:—Firstly, they neutralize or remove any acid or acidic substances present; secondly, they retard the production of acid; thirdly, they form a protective film on the surface of the metal. However it is to be pointed out that the quantity used in any case is so small as to be catalytic.

This invention, however, is not limited to the use of a single substance or compound mentioned herein, or which are related to their respective class or groups, but I may also employ two or more of these substances in combination with each other, in connection with the stabilization of halogenated hydrocarbons, or I may use a substance which forms a part of certain compounds mentioned herein.

The tests of materials hereinbefore set forth are by way of example only, and are not to be taken as limiting the invention which includes the use of all of those compounds disclosed, as inhibitors for decomposition and corrosion, as well as materials which are merely higher homologues, or derivatives, or substitution products of the disclosed inhibiting compounds.

I claim:

1. Carbon tetrachloride containing a stabilizing amount of a ureide.

2. Carbon tetrachloride containing a stabilizing amount of guanidine.

EDMUND C. MISSBACH.

Patented Oct. 3, 1939

175

2,174,534

UNITED STATES PATENT OFFICE

2,174,534

CHEMICAL PROCESS

Joseph Harrel Shipp, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware

No Drawing. Application April 22, 1936, Serial No. 75,868

20 Claims. (Cl. 8—118)

This invention relates to the treatment of textiles, particularly cellulosic fibers, yarns and fabrics, with sulfuric acid to obtain parchmentizing effects; and more particularly to the treatment of cotton fabrics with concentrated sulfuric acid containing an agent which will inhibit the tendering effect of the acid.

It is generally known that concentrated sulfuric acid is destructive to textile materials, nevertheless certain uses of sulfuric acids on textiles are so advantageous that endeavors have been made to so treat textiles with sulfuric acid as to obtain the desired effects but to avoid the undesirable effects. Thus there is a series of patents which deal with the treatment of fabrics with sulfuric acid in connection with a series of mercerization treatments.

This invention has as an object the production of permanent finishes on fabrics. A further object is the production of permanent finishes on yarns, textiles, fabrics, paper and the like. A still further object is the production of parchmentized effects on cellulosic fabrics. A still further and particularly desirable object is the production of organdy finishes on cotton fabrics. Other objects will appear hereinafter.

These objects are accomplished by the following invention wherein the fabric to be treated is passed continuously through the parchmentizing bath consisting of especially inhibited strong sulfuric acid, thence through rolls or other means for squeezing out the excess parchmentizing reagent, then through washing and neutralizing baths, and finally over a calender or other drying means. In this procedure the speed and time of immersion of the goods in the parchmentizing bath are adjusted with due regard to the result desired and to the end that the goods are transparentized to the desired degree and that the parchmentizing reagent is washed out before the goods are tendered to an objectionable degree.

The novel feature of this process is the parchmentizing reagent which consists of strong sulfuric acid of at least 65% concentration and preferably from 80% to about 98%, having dissolved therein an agent capable of inhibiting or at least greatly retarding the normal degrading action of strong sulfuric acid upon cellulose. This agent is termed the cellulose degradation inhibitor. In the claims the percentage composition of the acid refers to the composition of the acid prior to the introduction of the inhibitor.

It is known that strong sulfuric acid has a marked degrading or disintegrating effect on cellulose fibers, which in the case of acid of moderate strength quickly produces a marked tendering of the fiber and in the case of concentrated sulfuric acid such as 96%, results in almost instantaneous and complete destruction of the fiber.

Now it has been discovered that the degrading effect of the acid on the cellulose may be inhibited or retarded by dissolving in the acid certain agents which are termed inhibitors of cellulose degradation. An inhibitor suitable for use in this invention may be known by the fact that it meets the following tendering resistance test. For this test, 20 parts of the material to be tested is dissolved in 100 pts. of 96% sulfuric acid, the solution is brought to 20° C. and a sample of cotton voile of known tensile strength is immersed therein for a period of 30 seconds after which the sample is withdrawn from the acid; washed to neutrality, and dried by ironing. The sample is now examined for parchmentizing and tested for loss or gain of tensile strength. If the sample is found to be parchmentized and to have increased in tensile strength or to have lost less than 25% of its original tensile strength, it is considered that the agent tested is a satisfactory inhibitor of degradation for use in this invention.

If a cotton fabric is immersed in 96% sulfuric acid at room temperature, removed immediately and rinsed very quickly with a large volume of water, the fabric is disintegrated and destroyed. However, if as much as 25 parts by weight of urea is first added to each 100 parts of acid, then a fabric may be treated with this solution up to 60 seconds without being appreciably tendered. If fabrics so treated are washed free of acid, using dilute alkali if desired, then ironed dry, a pleasant, stiff, springy finish is obtained. When this treatment is applied to cotton voile or lawn, an organdy finish results. Not only is the cloth stiff and springy, but it is also more transparent than the original cloth. The effect is permanent to washing. Instead of urea, certain other materials may be used. These are listed below.

In carrying out the process in its preferred form, the agent is first dissolved in concentrated sulfuric acid with cooling if necessary to prevent decomposition. The sulfuric acid may be from about 65 and preferably from 85 to over 100 per cent strength. From 10–30 parts by weight of agent per 100 parts of acid is satisfactory. The quantity of agent, as well as the concentration of initial acid, may be varied somewhat depending on the time the textile material is to be in contact with the solution, and depending on the effect it is desired to produce. The parchmentizing is slower and less pronounced with increasing quantities of inhibitor. The time of contact of the textile material with the solution will ordinarily be determined by the speed at which the fabric sheet is run through the solution. From 10 to 30 seconds is usually sufficient, but under suitable conditions the time of contact may be 60 seconds or more, without damage to the fabric.

The solution may be used at room temperature or at temperatures below room temperature.

Lowering the temperature retards the parchmentizing effect. It will be seen that the degree of parchmentizing obtained can be varied at will over very wide limits by varying (1) the amount of inhibitor in the acid, (2) the amount of water in the acid, (3) the temperature of the solution, and (4) the time of contact of the cellulosic material with the solution.

The textile material, e. g., cotton fabric, is passed through the acid solution and then into water to remove the acid, then dried by ironing or calendering, or on a tenter frame which exerts a shearing action to minimize sticking together of the warp and filling threads at points of contact. The washing may be facilitated by using water first, followed by a dilute solution of a base such as ammonium hydroxide or sodium hydroxide. It is important that the greater part of the acid be washed out very rapidly in order to avoid local heating which would destroy the fabric. If a cellulosic material is treated in a solution of one of these agents and sulfuric acid, and then slowly immersed in water, the cellulosic material will be tendered or totally destroyed.

A novel fabric has been produced by treating cotton web, produced on a carding machine, with these inhibited sulfuric acid solutions. The fibers are stuck together at each point of contact, resulting in a strong sheet. This process affords a possibility of omitting the steps of spinning and weaving in the preparation of fabrics suitable for a variety of purposes.

Instead of using a single agent in the solution two or more may be used from the same or from different groups, or certain other agents may be added to give enhanced effects. A solution containing an amide and an ether, or an amide and an alcohol, or an amide and an amine, will give very satisfatory parchmentizing effects with practically no tendering of the cellulosic material. The use of additional agents also affords means of varying the effects obtained. Thus, an amide alone or an amide and an amine, or an amide and an alcohol, produce transparent organdy finishes, whereas an amide and a relatively large proportion of an ether produce an opaque parchmentized effect. Also, some agents give a more transparent finish than others. Thus, acetanilide and decamethylenediamine give opaque finishes.

If only limited areas of a fabric are treated by this process, a pattern effect may be obtained. Alternatively, certain areas of the fabric may be immunized against the sulfuric acid treatment and the fabric may then be treated over its entire surface with the acid to obtain pattern effects. Thus, areas printed with paraffin are not affected by the acid treatment, and this affords a means of immunizing against sulfuric acid.

Unfinished cotton fabrics can be treated by this process without any previous or subsequent mercerization and will yield, by a single treatment, a transparent organdy finish. The advantage of this process is obvious when it is considered that the present process of producing permanent organdy finishes normally involves three major operations: (1) mercerization, (2) acid treatment, and (3) mercerization; or (1) acid treatment, (2) mercerization, and (3) acid treatment. If some particular effect is desired, fabrics treated with concentrated sulfuric acid containing an inhibitor may be previously and/or subsequently mercerized, or mercerization may be carried out between two acid treatments, but when applying the process of this invention, the mercerization step is not necessary to produce a good permanent organdy finish.

Instead of washing the fabrics in water after the acid treatment, they may first be washed in aqueous sulfuric acid (25 to 50 per cent H_2SO_4) and then washed in water. This reduces the cost of the treatment, since the dilute sulfuric acid produced, may be utilized in other operations.

While the use of inhibited sulfuric acid is of particular interest and value on cotton fabrics, for producing organdy effects, linen, and rayon may also be treated by this process with advantageous results. In this manner an organdy finish can be obtained on rayon voiles.

Fabrics or yarns treated by this process may be stretched during or after the acid treatment. The tenacity of cellulosic yarns is increased by stretching during or after the acid treatment.

In the above the invention has been considered in considerable detail, the principles of the invention being set forth minutely. The following examples still further illustrate the invention, but are purely illustrative and not limitative.

Example 1

To 100 g. of concentrated sulfuric acid (sp. gr. 1.84, 95.5–96.5 per cent H_2SO_4) was added 20 g. of urea, the acid being cooled during the addition of the urea. After the urea was completely dissolved, the solution was cooled to 20° C. A 68/76 unfinished cotton voile fabric was immersed in the solution for 30 seconds, removed, drained for a few seconds, then plunged into water at room temperature. After washing thoroughly in water it was rinsed in a 3 per cent solution of ammonium hydroxide, rinsed in water and dried by ironing. A stiff, springy finish of the type commonly called transparent organdy was obtained. The fabric was boiled for one hour in 0.5 per cent soap solution, rinsed and dried. The finish was not appreciably affected by this laundering.

If it is desired, the fabric may be mercerized with caustic in the usual way either before or after, or both before and after, the above acid treatment. Alternatively, two acid treatments of the type indicated may be given the fabric with mercerization between the two acid treatments.

Example 2

A 68/76 unfinished cotton voile fabric was immersed for 60 seconds in a solution of 20 g. thiourea in 100 g. 96% sulfuric acid, removed, drained for a few seconds, rinsed in water, then in dilute ammonium hydroxide, and again in water, and dried by ironing. A transparent organdy finish was obtained which was permanent to washing.

Example 3

A 68/76 unfinished cotton voile fabric was immersed for 20 seconds in a solution of 20 g. formamide in 100 g. 96% sulfuric acid. It was then removed, drained for a few seconds, quickly rinsed in water, dilute ammonium hydroxide and water, then dried by ironing. A permanent transparent organdy finish was obtained.

Example 4

A 68/76 unfinished cotton voile fabric was treated for 20 seconds with a solution of 20 g. of acetamide in 100 g. 96% sulfuric acid. The fabric was then removed, drained for a few seconds, washed with water, dilute ammonium hydroxide and water, and dried by ironing. A transparent organdy finish was obtained. This finish

was permanent to washing although the fabric was slightly tendered by the treatment.

Example 5

A 68/76 unfinished cotton voile fabric was immersed for 20 seconds in a solution made by adding 20 g. oxamide to 100 g. 96% sulfuric acid. The oxamide was only partially soluble in the acid. The fabric acquired a permanent transparent organdy finish but was slightly tendered.

Example 6

A 68/76 unfinished cotton voile fabric was treated for 20 seconds with a solution of 20 g. acetanilide in 100 g. 96% sulfuric acid. An opaque organdy finish was obtained and the fabric was only very slightly tendered by the treatment.

Example 7

A 68/76 unfinished cotton voile fabric was treated for 30 seconds in a solution of 25 g. of diethyl ether in 100 g. of 96% sulfuric acid. After the fabric was washed and dried it possessed a transparent organdy finish which was permanent to washing.

Example 8

An unfinished cotton voile fabric was treated for 10 seconds with a solution of 25 g. of ethyl alcohol in 100 g. 96% sulfuric acid, then washed in water, dilute ammonium hydroxide and water, and dried. A transparent organdy finish was obtained which was permanent to washing.

Example 9

An unfinished cotton voile fabric was treated for 20 seconds in a solution of 25 g. of acetone in 100 g. 96% sulfuric acid, washed and dried. A permanent organdy finish was obtained.

Example 10

An unfinished cotton voile fabric was treated for 10 seconds with a solution containing 20 g. of guanidine carbonate in 100 g. 96% sulfuric acid. A pleasing permanent organdy finish was obtained.

Example 11

An unfinished cotton voile fabric was treated for 10 seconds with a solution containing 25 g. of phenyl hydrazine in 100 g. 96% sulfuric acid. A permanent organdy finish was obtained. The fabric was slightly discolored.

Example 12

A 68/76 unfinished cotton voile fabric was treated for 10 seconds in a solution of 20 g. of urea and 5 g. of diethyl ether in 100 g. of 96% sulfuric acid. After the fabric was washed and dried, it possessed a transparent organdy finish which was permanent to washing. The tensile strength of the fabric was slightly greater than that of a fabric treated in a solution containing only urea and sulfuric acid.

Example 13

A 68/76 unfinished cotton voile fabric was treated for 20 seconds with a solution of 5 g. urea and 20 g. diethyl ether in 100 g. 96% sulfuric acid. The acid was washed out with water and dilute ammonium hydroxide and the fabric dried by ironing. An opaque organdy finish was obtained, the treated fabric being stiff and springy but no more transparent than the untreated fabric.

Example 14

A 68/76 unfinished cotton voile fabric was treated for 10 seconds with a solution of 20 g. urea and 5 g. ethyl alcohol in 100 g. 96% sulfuric acid. The fabric was washed free of acid and dried by ironing. A transparent organdy finish of good tensile strength was obtained.

Example 15

A 68/76 unfinished cotton voile fabric was treated for 20 seconds with a solution containing 5 g. of urea and 20 g. of ethyl alcohol in 100 g. 96% sulfuric acid. A transparent organdy finish of high tensile strength was obtained.

Example 16

A 68/76 unfinished cotton voile fabric was treated for 20 seconds with a solution containing 25 g. of urea and 10 g. of water in 100 g. 96% sulphuric acid. After washing free of acid and ironing, a very stiff, transparent finish was obtained.

Example 17

A 68/76 unfinished cotton voile fabric was treated for 5 seconds with a solution containing 25 g. of urea and 10 g. of water in 100 g. 96% sulfuric acid. After washing free of acid and ironing, the fabric possessed a stiff, transparent organdy finish much less stiff than the fabric obtained in Example 16. The fabric was not appreciably tendered.

Example 18

A 68/76 unfinished cotton voile fabric was treated for 10 seconds in a solution containing 25 g. of urea and 100 g. of 100 per cent sulfuric acid. The fabric was washed free of acid and dried by ironing. A permanent transparent organdy finish was obtained.

Example 19

A viscose rayon crepe fabric was treated for 10 seconds with a solution containing 25 g. of urea in 100 g. 96% sulfuric acid. The fabric was then washed free of acid and dried by ironing. The fabric was stiffer and more transparent than the original fabric and was only very slightly tendered.

This process can be applied to cotton, linen, viscose rayon or other regenerated cellulose fabrics, threads or fibers. Although the chief purpose of the invention is to produce organdy finishes on cotton voile fabrics, permanent starched effects may be obtained on heavier fabrics. The invention is applicable to all types of cellulosic fabrics, but the results are particularly desirable with textile materials such as cotton, viscose rayon, etc. The process is also applicable, as shown in the following example, to the preparation of parchment paper.

Example 20

An unsized sulfite paper weighing 20 lbs. per 500 sheets measuring 25"×38" was treated for 30 seconds in a solution of 20 g. of urea dissolved in 100 g. of 96% sulfuric acid, then washed in water until free of acid. The paper was dried by ironing. As a result of this treatment the paper was parchmentized. It was denser, harder, and more transparent than the untreated paper. The treated paper has a much greater wet strength as revealed by a qualitative test in which both treated and untreated paper were wet and broken in the hand. The resistance of the wet paper to rubbing was also greatly increased by the treat-

ment. The grease resistance of the treated and untreated paper was tested by placing the papers over white blotting paper and placing a drop of dyed turpentine on each in one test and a drop of a dyed cotton seed oil on each in a second test, and noting the time required for the oil to pass thru the paper. Both the turpentine and vegetable oil penetrated the untreated paper instantly. The turpentine penetrated the treated paper in about one minute but the cotton seed oil had not penetrated after a quarter of an hour. When written upon with ink the treated paper gave a smooth even line whereas the untreated paper gave an irregular line due to the blotting effect.

The sulfuric acid used in the parchmentizing reagent may vary from about 80 to 100% H_2SO_4 or even higher and is preferably from about 90 to 98% H_2SO_4. When the inhibitor of cellulose degradation is an amide, for example, urea, useful results may be obtained with acid concentrations as low as 65% H_2SO_4. The concentration of the inhibitor in the acid may vary within rather wide limits depending on the inhibitor itself and on the other conditions present. Under some conditions ratios as low as 5 parts inhibitor to 100 parts acid may be useful and ratios as high as 35 parts per 100 of acid may also be used provided the inhibitor is sufficiently soluble in the acid. The process is most desirably operated at normal temperature but the temperature may be varied somewhat above or below this point as desired.

In view of the number of variable factors, it is impossible to set forth in a patent application every possible combination of conditions which may be successfully operated. Given the requirement that a given quality of finish is to be produced on a given fabric using a given inhibitor of degradation, it is essential that the variables be adjusted so as to coordinate the reaction rate and the time of treatment so that a finish is obtained having the required properties. The various factors affecting speed of reaction are temperature, concentration of acid, and the concentration of the inhibitor in the acid. The reaction rate may be increased by increasing the temperature, or by varying the concentration of the acid, or by decreasing the concentration of the inhibitor in the acid. In general the speed of the parchmentizing reaction is increased as the concentration of the acid approaches the point of maximum activity which is about 92%. Since the process is in general operated continuously, it is obvious that the time of contact may be adjusted by varying the speed of travel or by varying the length of travel in the parchmentizing bath.

When the situation is such that the time of contact may be varied at will, the inhibitor to be used, for example, urea, is dissolved in the acid, the concentration of the acid and of the inhibitor in the acid being maintained at any desired point within the limits which have been set and within the limit of solubility of the inhibitor in the acid, the parchmentizing bath is brought to the temperature at which it is desired to operate, preferably around normal, and the fabric is passed continuously through this acid bath, the speed of travel being adjusted so that the degree of parchmentizing is satisfactory and that the reagent is washed out of the fabric before the fabric is tendered to an objectionable degree. If desired, the optimum time of contact in the parchmentizing bath may be readily determined merely by immersing a small sample of the fabric in the parchmentizing reagent and varying the time of immersion until the required effect is produced after washing out the reagent and drying.

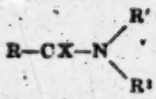
In the case where the time of treatment is limited, it may be necessary to adjust the speed of reaction between the cellulose and the reagent so that the reaction is completed within the time limit. For example, when it is desired to complete the reaction in shorter time, the reaction rate must be correspondingly increased and this result may be effected by increasing the temperature, or by decreasing the concentration of the inhibitor in the acid or by varying the concentration of the acid. When it is desired to reduce the reaction rate so as to permit a longer time of contact, this may be brought about by decreasing temperature or by varying the concentration of the acid or of the concentration of the inhibitor in the acid.

The process is not limited to any particular type of apparatus. The nature of the reagents will necessitate apparatus which is not corroded by concentrated sulfuric acid. With proper precautions, iron apparatus may be satisfactory. The treatment of the fabric may consist in passing it through the acid solution containing the inhibitor at such a rate that it will be thoroughly wet out by the acid, through squeeze rolls to remove excess acid, then into water at room temperature or below. It is essential that the water treatment should be such that the acid is diluted very rapidly. This will avoid having local areas become hot enough to cause tendering of the fabric. Subsequently, the fabric should be washed entirely free of acid using dilute alkali baths if desired, and then dried, either on a tenter frame or on hot rolls or calenders. The fabric may be given any other treatment desired for any particular finish. Thus, it may be tenter sheared to break down the bond at the intersection of warp and filling yarns, thereby preventing the finished organdy from having a "boardy" feel. For the most part the treatment in accordance with the present invention may be carried out in ordinary textile plant equipment.

The fabric may be treated over its entire surface or only on certain areas, so as to give pattern effects. For this treatment, the acid containing the inhibitor could be printed on by ordinary printing methods, using corrosion-resistant printing rolls. The treatment may be carried out by protecting certain areas with unreactive materials, such as paraffin, and then treating the entire fabric. In this way, the protected areas are not affected, and a pattern effect may also be obtained.

The process of the present invention has been illustrated with the use of amides which are the preferred class of inhibitors or negative catalysts of the present invention. In addtion, the use of ethers, alcohols, ketones, amines and mixtures of ethers and amides have been exemplified. As explained earlier in this specification, suitable inhibitors are soluble in 96% H_2SO_4 and may be known by the fact that they react positively in the tendering resistance test. Those inhibitors which are of low molecular weight are particularly desirable. Thus urea, thiourea, formamide and ethanol-formamide are excellent inhibitors. Acetamide and acetanilide are effective but not to the extent of those just mentioned. Oxamide and decamethylene-diamine formamide may be used, as well as the amides of formic acid with forked chain amines wherein the alkyl group of the amines contains at least six carbon atoms and a forked chain.

These low molecular weight amido compounds are defined by the formula



wherein R may be hydrogen, an amido (NH_2) group or an alkyl group, R' and R^2 are hydrogen or hydrocarbon radicals and X may be oxygen, sulfur or an imino group. These compounds are particularly effective when the compound contains 10% or more of nitrogen. In addition to those already mentioned guanidine, diphenylguanidine, urea-formaldehyde resins and aminoguanidine bicarbonate are effective as inhibitors to varying extents.

In addition to the amido compounds, above discussed, which form perhaps the most preferred class of inhibitors, amino compounds, e. g. decamethylene diamine, hexamethylene diamine, ethylene diamine, hexamethylene tetramine, 1, 3-diaminopropanol-2, dibutylamine, and triethanolamine are effective as modifiers for concentrated sulfuric acid, i. e. sulfuric acid of at least 80% concentration.

Low molecular weight alcohols soluble in concentrated sulfuric acid have also been found to be effective inhibitors for use with sulfuric acid of at least 80% concentration, including glycerol, methanol, ethanol, butanol, ethylene glycol, isopropanol and 1, 3-diaminopropanol-2.

Similarly, ethers such as diethyl ether and diethylene glycol have been found useful in inhibiting the tendering of cellulosic materials by sulfuric acid.

Acetone, methyl ethyl ketone and dipropyl ketone are effective in the order given, acetone being the preferred ketone.

In general the inhibitory effect decreases with increased molecular weight in a given series. The low molecular weight amides are more effective and are also more soluble, particularly the amides and amido derivatives of monocarboxylic acids.

Materials which give viscous solutions are less desirable than those which give limpid solutions, presumably because of the difference of ease of washing off the acid and also because of the slow wetting of the fabrics by these solutions.

While acids of concentration of approximately 80% and higher show the advantages of the use of amido derivatives in the most noteworthy manner, the use of amides is also advantageous with acids heretofore used as parchmentizing acids, for example, acids as low as 65% H_2SO_4 as shown in the following example. At the other end of the concentration range, acids of 100% strength and over, for example, 103% (thus containing free SO_3) may be employed with good results.

Example 21

A 68/76 unfinished cotton voile fabric was treated for 20 seconds in a solution of 40 gms. urea in 800 gms. of 70% sulfuric acid. The fabric was then washed and dried by ironing. This treatment resulted in a stiff springy finished but slightly harsh for an organdy.

Example 22

A 68/76 unfinished cotton voile fabric was treated for 20 seconds in a solution of 50 gms. urea in 800 gms. of 70% acid. After washing and ironing, the fabric possessed a springy organdy finish. The fabric was not noticeably tendered.

It is at the higher ranges of concentration, for example, at 85% and above that the advantages of this invention are most striking. This is all the more surprising since materials such as formaldehyde which have hithertofore been recommended for use with acids of moderate concentration are ineffective with the concentrated acid.

Voil fabrics were treated for 20 seconds each in acids of the following compositions and tensile strengths determined with the results noted. The tensile strength shown is the force in pounds necessary to break a one inch strip of the cloth.

	Pounds
1. Untreated cloth	7.5
2. Cloth treated with solution of 20 gms. urea in 100 gms. 96% sulfuric acid	6.7
3. Cloth treated with solution of 20 gms. urea in 110 gms. of 87% sulfuric acid	9.3
4. Cloth treated with solution of 30 gms. urea* in 105 gms. of 91% sulfuric acid	10.2
5. Cloth treated with 96% sulfuric acid	0.0

*This amount of urea was not completely soluble in the acid at room temperature and so was not all in solution.

In addition to use in the treatment of fabrics, solutions of these inhibitors in sulfuric acid may be used for parchmentizing paper and treating regenerated cellulosic films, and as regeneration baths in the spinning of viscose yarn, or for subsequent treatment of viscose yarn, for example, to secure higher tenacity.

The parchmentized effects obtained by the present invention are not necessarily superior to the effects obtained by prior art methods but these effects can be obtained more consistently and with less spoilage of goods than is obtained by prior art processes. Thus in one of the recognized prior art processes for producing organdy finishes, there is first a mercerization in 20–25 per cent sodium hydroxide, followed by a treatment at a low temperature and at an inconveniently high speed, with sulfuric acid of about 66% concentration. The high speed is necessary to avoid ruining the fabric. Following the acid treatment the cloth is given another mercerization. On the other hand the process of this invention involves in its simplest form only a single acid treatment carried out at room temperature, in order to produce a satisfactory organdy finish. Furthermore the process of the present invention allows of a very great variation in the effects obtained, since the various factors such as time and temperature of treatment, and agents used can be varied at will over rather wide limits according to the effects desired.

The above description and examples are intended to be illustrative only. Only modification of or variation therefrom which conforms to the spirit of the invention is intended to be included within the scope of the claims.

I claim:

1. Process which comprises immersing a cotton fabric at 20° C. for 30 seconds in a solution of 20 g. urea in 100 g. of 96% sulfuric acid, removing from said solution, washing with water and then with 3% ammonia solution and drying by ironing.

2. Process which comprises treating cotton fabric with sulfuric acid of at least 85% concentration containing 5–35 parts by weight of urea per 100 parts of H_2SO_4.

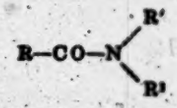
3. Process which comprises treating cotton fabric with concentrated sulfuric acid of at least 65% strength containing urea.

4. Process which comprises treating cellulosic textile materials with sulfuric acid of at least 65% strength containing urea.

5. Process which comprises treating cellulosic textile materials with sulfuric acid of at least 85% concentration containing in solution therein 5–35 parts by weight of urea per 100 parts of concentrated sulfuric acid.

6. Process which comprises treating cellulosic material with sulfuric acid of at least 65% concentration containing dissolved therein a low molecular weight amide.

7. Process which comprises treating cellulosic textile material with a solution in sulfuric acid of at least 65% strength of an amide of the formula



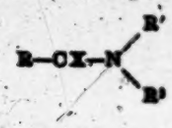
wherein R, R′ and R² are hydrogen or organic radicals containing up to six carbon atoms, the nitrogen content of said amide being at least 10%.

8. Process which comprises treating a cellulosic fabric with a parchmentizing reagent until a stiff, springy, at least partly transparentized finish is obtained, thereupon discontinuing the treatment, and promptly washing out the reagent, said parchmentizing reagent comprising sulfuric acid of at least 80% concentration having dissolved therein per 100 parts acid from 5–35 parts of a cellulose degradation inhibitor, said inhibitor comprising a low molecular weight amide which is soluble in 96% sulfuric acid at 20° C. to the amount of at least 20 parts per 100 of acid and which is further characterized by the fact that it reacts positively in the tendering resistance test, said test comprising, the step of dissolving 20 parts inhibitor in 100 parts 96% sulfuric acid, bringing the solution to 20° C., immersing therein a sample of cotton voile for a period of 30 seconds, thereupon removing the sample from the bath, and promptly washing out the acid and drying, a positive test being indicated by the fact that the sample is found to be at least partly parchmentized and to have lost not more than 25% of its original tensile strength.

9. As a treating agent for cellulosic materials, a concentrated sulfuric acid solution of urea.

10. As a treating agent for cellulosic materials, a solution, in sulfuric acid of at least 65% concentration, of urea.

11. As a treating agent for cellulosic materials a solution, in sulfuric acid of at least 85% concentration, of an amido compound of the formula



wherein R is hydrogen, an amino group or an alkyl group, R′ and R² are hydrogen or hydrocarbon radicals and X is oxygen sulfur or an imino group.

12. Process which comprises treating a cellulosic fabric with a parchmentizing reagent until a stiff, springy, at least partly transparentized finish is obtained, thereupon discontinuing the treatment, and promptly washing out the reagent, said parchmentizing reagent comprising sulfuric acid of at least 80% concentration having dissolved therein per 100 parts acid from 5–35 parts of a cellulose degradation inhibitor, said inhibitor comprising a low molecular weight amide which is soluble in 96% sulfuric acid at 20° C. to the amount of at least 20 parts per 100 of acid.

13. Process which comprises treating cellulosic textile materials with sulfuric acid of at least 65% concentration containing thiourea in solution therein.

14. Process which comprises treating cellulosic textile materials with sulfuric acid of at least 65% concentration containing in solution therein 5–35 parts of thiourea per 100 parts of concentrated sulfuric acid.

15. Process which comprises treating cellulosic textile materials with sulfuric acid of at least 65% concentration containing foramide in solution therein.

16. Process which comprises treating cellulosic textile materials with sulfuric acid of at least 65% concentration containing in solution therein 5–35 parts of foramide per 100 parts of concentrated sulfuric acid.

17. Process which comprises treating cellulosic textile materials with sulfuric acid of at least 65% concentration containing therein as a cellulose degradation inhibitor a low molecular weight amide soluble in 96% sulfuric acid at 20° C. to the extent of at least 20 parts per 100 parts of acid and having its amido group attached to a carbon atom doubly bonded to a non-metallic member of the sixth group of the periodic table having a molecular weight between 16 and 32.

18. Process for producing an organdy effect which comprises treating a thin cellulosic fabric with sulfuric acid of at least 65% concentration containing dissolved therein a low molecular weight amide.

19. Process for producing an organdy effect which comprises treating a thin cotton textile material with sulfuric acid of at least 85% concentration containing in solution therein 5–35 parts by weight of urea per 100 parts of concentrated sulfuric acid.

20. Process for producing an organdy effect which comprises treating a thin cotton textile material with concentrated sulfuric acid of at least 65% strength containing urea.

JOSEPH HARREL SHIPP.

CERTIFICATE OF CORRECTION.

Patent No. 2,174,534. October 3, 1939.

JOSEPH HARREL SHIPP.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, first column, line 65, for the word "finished" read finish; page 6, second column, lines 28 and 33, claims 15 and 16 respectively, for "foramide" read formamide; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of March, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

320 Northern District of Illinois, } ss:
Eastern Division.

I, Roy H. Johnson, Clerk of the District Court of the United States for the Northern District of Illinois, do hereby certify the above and foregoing to be a true and complete transcript of the proceedings had of record made in accordance with the Amended Designation of Appellant and the Supplemental Designation of Appellee, filed in this Court in the cause Entitled *John H. Wallace, Jr., Plaintiff,* v. *Mandel Brothers, Inc., a corporation, Defendant,* Civil Action No. 43 C 906, as the same appear from the original records and files thereof now remaining in my office.

In Testimony Whereof, I have hereunto subscribed my name and affixed the seal of the aforesaid Court at Chicago, Illinois, this 4th day of December, A. D. 1946.

Roy H. Johnson,
Clerk.

(Notarial Seal)

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

I, Kenneth J. Carrick, Clerk of the United States Circuit Court of Appeals for the Seventh Circuit, do hereby certify that the foregoing printed pages contain a true copy of the printed transcript of the record filed in this office on the twenty-sixth day of May, 1947, in

Cause No. 9261.

John H. Wallace, Jr.,
Plaintiff-Appellant,

vs.

Mandel Brothers, Inc.,
Defendant-Appellee,

as the same remains upon the files and records of the United States Circuit Court of Appeals for the Seventh Circuit.

In Testimony Whereof I hereunto subscribe my name and affix the seal of said United States Circuit Court of Appeals for the Seventh Circuit, at the City of Chicago, this 30th day of January, A. D. 1948.

Kenneth J. Carrick,
(Seal) *Clerk of the United States Circuit Court of Appeals for the Seventh Circuit.*

At a regular term of the United States Circuit Court of Appeals for the Seventh Circuit, held in the City of Chicago, and begun on the First day of October, in the year of our Lord One thousand nine hundred and forty-six, and of our Independence the one hundred and seventy-first.

9261	John H. Wallace, Jr., *Plaintiff-Appellant,* *vs.* Mandel Brothers, Inc. A Corporation, *Defendant-Appellee.*	Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

And, to-wit, on the fourteenth day of December, 1946, there was filed in the office of the Clerk of this Court The District Court Clerk's Certificate to Exhibits which said certificate to exhibits is in the words and figures following, to-wit:

Northern District of Illinois } ss.
Eastern Division }

I, Roy H. Johnson, Clerk of the District Court of the United States for the Northern District of Illinois, do hereby certify and transmit to the United States Circuit Court of Appeals for the Seventh Circuit certain original Exhibits in the case entitled: John H. Wallace, Jr., *vs.* Mandel Brothers, Inc., a corporation, No. 43 C 906, said Exhibits are marked as follows, to-wit:

Wallace Exhibits 1 and 3;

Plaintiff's Exhibits, 4, 5, 6, 7, 8, 9 and 2, 11, 12, 13, 14, and 15;

Defendant's Exhibits, A, B, D, F, G, H, I, J, K, M, N, O, P, Q, R, and S.

In Testimony Whereof, I have hereunto subscribed my name and affixed the seal of the aforesaid Court at Chicago, Illinois, this 4th day of December, A. D. 1946.

Roy H. Johnson,
(Seal) *Clerk.*

Endorsed: Filed Dec. 14, 1946, Kenneth J. Carrick, Clerk.

And on the same day, to-wit, on the fourteenth day of December, 1946, there was filed in the office of the Clerk of this Court an appearance of counsel for the appellant which said appearance is in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

Cause No. 9261.

John H. Wallace, Jr.,

vs.

Mandel Brothers, Inc., a corporation.

The Clerk will enter appearance as counsel for Plaintiff-Appellant.

Charles J. Merriam per B.W.
2800—141 W. Jackson Blvd.,
Chicago.

Endorsed: Filed Dec. 14, 1946. Kenneth J. Carrick, Clerk.

And afterwards, to-wit, on the seventeenth day of December, 1946, there was filed in the office of the Clerk of this Court an appearance of counsel for the appellee which said appearance is in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

Cause No. 9261.

John H. Wallace, Jr.,
Plaintiff-Appellant,

vs.

Mandel Brothers, Inc.,
Defendant-Appellee.

The Clerk will enter my appearance as counsel for Appellee.

Thos. H. Sheridan,
135 So. LaSalle St.,
Chicago, Ill.

Endorsed: Filed Dec. 17, 1946. Kenneth J. Carrick, Clerk.

And afterwards, to-wit, on the seventh day of January, 1947, there was filed in the office of the Clerk of this Court an appearance of counsel for the appellee which said appearance is in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

Cause No. 9261.

John H. Wallace, Jr.,
Plaintiff-Appellant,

vs.

Mandel Brothers, Inc.
Defendant-Appellee.

The Clerk will enter my appearance as counsel for Appellee.

Charles R. Sprowl,
134 S. La Salle St.

Endorsed: Filed Jan. 7, 1947. Kenneth J. Carrick, Clerk.

And afterwards, to-wit, on the tenth day of November, 1947, the following further proceedings were had and entered of record, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit

Chicago 10, Illinois.

Monday, Nov. 10, 1947.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. J. Earl Major, Circuit Judge.
Hon. Walter C. Lindley, District Judge.

9261	John H. Wallace, Jr., *Plaintiff-Appellant,* *vs.* Mandel Brothers, Inc., a Corporation, *Defendant-Appellee.*	Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Now this day come the parties by their counsel, and this cause comes on to be heard on the transcript of the record and the briefs of counsel, and on oral argument by Mr. Charles J. Merriam counsel for the Appellant, and by Mr. Thomas H. Sheridan counsel for the Appellee, and the Court takes this matter under advisement.

And afterwards, to-wit, on the twelfth day of December, 1947, there was filed in the office of the Clerk of this Court the opinion of the Court which said opinion is in the words and figures following, to-wit:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 9261. October Term and Session, 1947.

JOHN H. WALLACE, JR., *Plaintiff-Appellant,*
vs.
MANDEL BROTHERS, INC. A Corporation, *Defendant-Appellee.*

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

December 12, 1947.

Before EVANS, MAJOR, *Circuit Judges,* and LINDLEY, *District Judge.*

LINDLEY, *District Judge.* Plaintiff, owner of the Wallace and Hand patent No. 2,236,387 applied for May 3, 1938, issued March 25, 1941, appeals from a judgment of invalidity of Claims 1 to 6, 8 to 13, 15 and 16 inclusive. The District Court found that if the claims should be held valid, defendant infringes.

The patentees claimed "a perspiration inhibiting composition" of a liquid "solution of aluminum sulfate" or, as an alternative, "aluminum chloride," both well known and long used in anti-perspirant compositions in liquid form, to which they added a new element, urea (carbamide), as they said, as "a neutral protective ingredient." In their specifications they stated that their invention related to an improved perspiration retarding or inhibiting compound; that it had previously been proposed to control the flow of perspiration from certain skin areas by application of

solutions containing an acid salt of a heavy metal, usually, aluminum chloride or aluminum sulfate; that such solutions, though effective in retarding perspiration, had proved unsatisfactory and hazardous in that their use frequently produced acute skin irritation and destroyed the clothing fabric with which they came in contact. They discussed various prior unsuccessful attempts to overcome this disadvantageous effect, saying that, prior to their invention, corrosive action of effective perspiration inhibiting preparations had been considered inherent and unavoidable. They commented upon other scientists' tested additions of alkalies to the old compounds, stating that when such acid counteracting agents were added, the perspiration retarding action was destroyed. They asserted that in their composition they had advantageously retained the desirable retarding effects of previous compounds and had, by the addition of urea, done away with corrosive action, thus avoiding any harm to skin or fabric. It is apparent, therefore, that their asserted invention is the use, in combination with elements known to the prior art, of urea, which has the quality of removing the undesirable corrosion of earlier commercial preparations, while, at the same time, retaining their advantages, which, plaintiff asserts, result from retention of acidity.

The court found that the acidity of earlier compounds had been harmful in that it irritated sensitive skins and injured the user's clothing; that urea is an organic compound, neutral in its action; that when added to the old preparations it does not weaken the perspiration inhibiting effect as did addition of the alkalies which counteracted the acid content and that the new composition successfully prevented corrosion and consequent injury to skin and fabric. In this respect, the evidence is convincing that Wallace's composition was tremendously successful commercially. We think, too, that the evidence discloses clearly an existing public demand for a compound possessing the desirable qualities mentioned and a fulfillment of that demand by the patented product.

However, the patent has been in litigation before the District Court of the United States for the Eastern District of New York, wherein it was held to have been anticipated. *Wallace* v. *Woolworth*, 45 F. Supp. 465. The decision was affirmed in 133 F. 2d. 763 (CCA2). Plaintiff insists that the evidence in that case has been supplemented by such

additional evidence as to impel a contrary decision upon our part.

The trial court discussed various prior art references including Schupphaus, No. 514,838 of February 13, 1894; Missbach, No. 2,069,711, February 2, 1937, application filed January 23, 1935; Shipp, No. 2,174,534, October 3, 1939, applied for April 22, 1936, and Koch, No. 2,011,292 of August 13, 1935. Schupphaus was interested in "securing the chemical stability of nitro-compounds," that is, explosives. He said that it was well known that "such compounds, when stored for a long period of time, often undergo decomposition, which, slight at first, gradually increases until the whole compound has become more or less decomposed"; that others had attempted to overcome decomposition by adding to nitro-compounds an alkali such as silicate of soda, carbonate of lime, magnesia and others, without success, for the reason that such alkalies being unstable themselves, had failed to prevent decomposition and that he had succeeded by using urea "as a neutralizer," which, he said, "penetrates every article of the nitro-compound" and arrests decomposition. In short, his claims prescribed the process of securing chemical stability in a nitro-compound by adding to the compound or incorporating therein, urea as specified. Concerning this patent the District Court said: "Schupphaus suggested the use of urea as a neutralizer, which he had found effective."

Koch was coping with the problem of a stable solution of aluminum acetate or aluminum formate. He suggested as novel, addition to old compounds of various elements including the alcohols and urea or thiourea. He added to the old solution this new element, teaching that this addition created stability of such solutions and that the resulting compound might be evaporated to dryness without decomposition of the aluminum salts. In his claims, therefore, he prescribed adding to well known solutions of aluminum salts "urea, thiourea, N-alkyl and aliphatic N-acyl derivatives of these compounds and salts of urea"; the resulting solution, he claimed, would not decompose and could be "evaporated to dryness." The District Court made no finding as to Koch; evidently it considered the reference inapplicable.

Missbach sought to improve cleaning solutions, such as carbon tetrachloride. He said that the compounds then being made tended to become corrosive; that the liberation of acid in them caused decomposition and that he proposed

that they be stablized and decomposition and corrosion neutralized by addition of another element. The additional factor, he said, need only be present as a small fraction of 1% of the total, such a small portion being efficient in stabilizing the solution. He suggested for his purpose various compounds such as the alcohols, polymerized castor oil, and others, including a group of compounds "which can be considered as derived from urea, termed ureides." He said that the addition of such an element to the old solutions neutralized or removed acid and retarded "the production of acid." He did not limit his invention to the use of a single substance but said that he might employ two or more of the suggested additional compounds. He claimed "Carbon tetrachloride containing a stabilizing amount of a ureide" and "carbon tetrachloride containing a stabilizing amount of guanidine." Concerning Missbach the trial court said: "We do not find anything in this patent that teaches that urea will inhibit the corrosive effect while leaving the solution sufficiently acid to be astringent."

But, said the District Court, "Shipp * * * is different." It found that "Urea was used by Shipp not as a neutralizer, but as an inhibitor of corrosive action and said that if addition of urea to a 96% solution of sulphuric acid would retard the corrosive or degrading effect upon cotton fabric, it might well be thought it would inhibit the corrosive action on skin or fabric and the acid residue left on the skin after using the ordinary preparations containing aluminum sulfate or chloride," and continued that "nothing but experimentation to be expected from skilled chemists was required to translate the disclosure of the corrosion inhibition of urea in the Shipp patent into the disclosure of the patent in suit for the inhibition of corrosive action of acid present in an anti-perspirant composition."

It is obviously necessary to determine whether the references lie within the confines of the prior art by which Wallace and Hand were bound, or whether they lie in an art lacking in analogy to anti-perspirants. Shipp, as the court found, was dealing with finishing manufactured textiles on which desired sheens were obtained by bath in concentrated sulphuric acid at room temperature. The old compound had been used by applying it to the fabric and, if at once removed the desired finish was obtained, but if it were permitted to remain longer in contact with the fabric, the latter was destroyed. Shipp taught that if there should be added as much as 25 parts of urea to 100 parts of the concentrate

the fabric might be subjected to contact with the compound for a slightly longer period; as he said, for as long as 60 seconds, without damage. He suggested as alternative diluents various alcohols, ethers, acetone and still others, none of which is of value in perspiration inhibiting compounds. Schupphaus was concerned solely with decomposition of explosives; Missbach with corrosion of cleaning compounds; Koch with stability of solutions of aluminum salts.

Though an inventor is conclusively presumed to know the prior art in his own and clearly allied lines of endeavor, *Ottinger* v. *Ferro Stamping & Mfg. Co.*, 59 F. 2d. 640, he is not bound by what has been done in remote or nonanalogous arts. *Alemite Mfg. Corp.* v. *Rogers Products Co., Inc.*, 42 F. 2d. 648. A reference, in order to be effective to disprove the novelty of an alleged invention, must relate to the same art as the questioned invention or to an analogous or closely related art. In *A. J. Deer Co., Inc.* v. *U. S. Slicing Machine Co.*, 21 F. 2d. 812 (CCA7), this court said: "We are of the opinion that whether arts or uses are analogous depends upon their elements and purposes. If elements and purposes in one art are related and similar to those in another art, and because and by reason of that relation and similarity make an appeal to the mind of a person having mechanical skill and knowledge of the purposes of the other art, then we are of the opinion that such arts must be said to be analogous, and, if the converse is true, they are nonanalogous arts."

In *Radiator Specialty Co.* v. *Buhot*, 39 F. 2d. 373 (CCA3), it was held that the inquiry as to whether two arts are analogous should be pursued along lines that distinguish not merely the physical differences in the arts but particularly the differences in their problems. In considering whether the stopping of leaks in hot water systems is analogous to the stopping of leaks in automobile tires, the court stated: "There has been a tendency, because of the fact of leaks and the common desire to stop them wherever they occur, to regard both arts as one. In consequence, the crowds of inventors in the two arts have become badly mingled and their inventive conceptions have become mixed and confused when applied to the problems and remedies of one art or the other. The test whether the arts are the same or different lies not in the fact, or in the thought, of leaks common to both arts, but in the difference in leaks, in the place of leaks, in the problems arising from differences in place and structure and in the means and methods of solving them."

This court said in *Copeman Laboratories Co.* v. *General Plastics Corp.*, 149 F. 2d. 962 at 964: "It is difficult to perceive how the making of chocolate drops is an art related to that of freezing ice cubes. The envisionment and uses of the two are entirely dissimilar. One has to do with contraction of chocolate and the other with expansion of ice. The patents themselves show not only that a different problem was involved, but the objective sought to be accomplished was also different. Those patents pertaining to the cholocate drops were, with the exception of Burger, trying to find a better means of cooling the chocolate in the matrices of the construction. One of defendant's witnesses admitted that the rubber used in the matrices was readily wettable by the chocolate; in the ice cube art the problem was to find something non-wettable by water. We are of the opinion that a person skilled in the art of making ice cube trays would not be expected to be conversant or familiar with the art pertaining to chocolate drops. An examination of the patent leads us to the conclusion that these patents concerning chocolate molding devices are non-analogous art and therefore not a pertinent reference. See *Alemite Mfg. Corp.* v. *Rogers Products Co., Inc.*, 42 F. 2d. 648, 651 (CCA3)."

Analogy in a complex field like chemistry is much more elusive than in the relatively simpler field of mechanics, *Naylor* v. *Alsop Process Co.*, 168 F. 911 (CCA8), for chemistry is essentially an experimental science and its foresight no more certan today, in spite of the accumulation of knowledge, than it was in former times, *General Electric Co.* v. *Laco-Philips Co.*, 233 F. 96 (CCA2). Chemical action and reaction can rarely be foretold except in cases of well-established, definite and usually small groups of compounds. Even in these, the question often arises as to whether one member of a class will act in the same manner as another in a particular combination. Hence dependable conclusions as to new and unknown reactions can seldom be drawn, even if two elements belong to the same group. Thus, in *Toledo Rex Spray Co.* v. *California Spray Chemical Co.*, 268 F. 201 (CCA6), in 1866 Bell and Fell obtained a patent for a process of making white lead by the direct action of nitric acid on lead oxide and addition of sulphuric acid. Later another patent issued for the process of making lead arsenate by the action of arsenic acid on nitrate of lead by direct precipitation. In sustaining this patent, the court said: "While in the

light of the invention of the patent, it may seem that it would naturally have occurred to one acquainted with the Bell and Fell disclosure to have tried the substitution of arsenic acid for sulphuric acid in making arsenate of lead, the fact remains that in the 40 years which elapsed since Bell and Fell it seems to have occurred to no one to try that experiment. In the light of this fact, and the further fact that mere analogy is not, in chemistry, usually so certain an index as in mechanics, we are not satisfied to say that it was within the expected skill of the chemist to know that Bell and Fell's process of making sulphate of lead * * * was equally available for producing arsenate of lead by the mere substitution of arsenic acid for sulphuric acid." See also *Wold* v. *Thayer & Chandler*, 148 F. 227 (CCA7).

In *Matthews Corp.* v. *Alliance Securities Co.*, 40 F. 2d. 879 (CCA8), a patent for an air brush for spraying paint was held valid over one which disclosed a closely similar device for spraying petroleum in an oil burner. Lack of analogy was found to exist between tanning leather and dyeing fabrics in *Tannage Patent Co.* v *Zahn*, 70 F. 1003 (CCA 3); between buffing or friction rolls and gear wheels in *General Electric* v. *Continental Fibre Co.*, 256 F. 660 (CCA2); between use of granulated copper in a gas mask to absorb ammonia and use of the same material in a process of removing ammonia from illuminating gas during its process of manufacture in *Yablick* v. *Protecto Safety Appliance Corp.*, 21 F. 2d. 885 (CCA3); between incubating eggs and drying tobacco in *Smith & Snow*, 294 U. S. 1, where the court said: "The Proctor and Knowles Patent * * * and the Schwarz Patent * * * of 1895, for methods and apparatus for drying tobacco and other materials, as well as other procedures for ventilation are so remote from the problems and procedure for hatching eggs as to call for no comment."

It would seem obvious from the foregoing announcements that the District Court erred in its conclusion that the patentees were bound by the teachings of the prior art of Shipp. As we have seen, Shipp was dealing with a problem which arose in the manufacture of cotton cloth. Certain of such fabrics are advantageously disposed of in commerce when they bear a sheen. Shipp found that the concentrate used as a bath for such cloth, which had proved very treacherous in use, could be made less so by the addition of urea so that the material upon which the sheen

was to be created could be bathed in the concentrate for as long as 60 seconds. The entire problem was one of finishing manufactured textiles. Shipp merely slowed up the disintegrating effect of the concentrate; he did not inhibit or bar it. Nor did he face the problem of retaining the beneficent acidic quality of a desirable anti-perspirant while inhibiting corrosion. We think he was very far from any art analogous to that with which the present patentees were concerned. They were dealing with a cosmetic, a cream, the desired effect of which was to remove or to prevent perspiration. They found that the old combination tended to injure the skin by corrosive action and incidentally damaged the fabric of the clothing of the user. As the District Court found, the patentees' prescription of urea did not destroy the pH of the solution. They made no attempt to eliminate acidity by adding alkalies,—a discarded ineffective expedient, but they added urea, which is neutral in chemical reaction and which did not eliminate acidity but so acted as to prevent corrosiveness. This was their discovery. They were not concerned with prevention of decomposition of explosives, as was Schupphaus, or with preventing decomposition of and stabilizing aluminum salt solutions, as was Koch, or with preventing corrosion of cleaning fluids as was Missbach. Where others failed to cure the known defects of antiperspirants, these patentees succeeded; no one had taught the industry how to proceed until they made their disclosure.

Though the District Court grounded its decision upon the Shipp patent, defendant insists that an earlier solution of the patentees anticipates. The evidence tendered upon this issue was largely excluded because of its hearsay character or other infirmity. But even were it in the record, we think it insufficient to sustain the burden of proving the defense. The proportions of the elements of the solution were not shown; the compound was corrosive to cloth; apparently the acid consumed the urea. All in all, the most that is shown is one of the experimental steps of the patentees falling short of their final achievement. The proffered evidence as to the product "Negatan" we think equally insufficient to prove anticipation.

The finding that the claims, if valid, are infringed, is, we think, in full accord with the evidence.

The judgment is reversed with instructions to proceed in accord with the announcements herein.

And on the same day, to-wit, on the twelfth day of December, 1947, the following further proceedings were had and entered of record, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

Friday, December 12, 1947.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. J. Earl Major, Circuit Judge.
Hon. Walter C. Lindley, District Judge.

John H. Wallace, Jr., *Plaintiff-Appellant,*	}	Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.
9261 *vs.*		
Mandel Brothers, Inc., *Defendant-Appellee.*		

This cause came on to be heard on the transcript of the record from the District Court of the United States for the Northern District of Illinois, Eastern Division, and was argued by counsel.

On consideration whereof, it is ordered and adjudged by this Court that the judgment of the said District Court in this cause appealed from be, and the same is hereby, Reversed, with costs, and that this cause be, and the same is hereby, remanded to the said District Court with instructions to proceed in accord with the opinion of this Court filed this day.

And afterwards, to-wit, on the twenty-sixth day of December, 1947, there was filed in the office of the Clerk of this Court a petition for rehearing which said petition is not set forth here.

And afterwards, to-wit, on the sixth day of January, 1948, the following further proceedings were had and entered of record, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit

Chicago 10, Illinois.

Tuesday, January 6, 1948.

Court met pursuant to adjournment.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. J. Earl Major, Circuit Judge.
Hon. Walter C. Lindley, District Judge.

John H. Wallace, Jr., *Plaintiff-Appellant,*	}	Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.
9261 *vs.*		
Mandel Brothers, Inc., *Defendant-Appellee.*		

It is ordered by the court that the petition for a rehearing of this cause be, and the same is hereby, denied.

And afterwards, to-wit, on the twelfth day of January, 1948, there was filed in the office of the Clerk of this Court a Notice and Motion for Stay of Mandate which said Notice and Motion are in the words and figures following, to-wit:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

7th Circuit

John H. Wallace, Jr.,
Plaintiff-Appellant,
vs.
Mandel Brothers, Inc.,
Defendant-Appellee.
} No. 9261.

NOTICE.

To: Charles J. Merriam,
2800 Board of Trade Building,
Chicago, Illinois,
Attorney for Plaintiff-Appellant.

Please take notice that we shall today file with the Clerk of the United States Circuit Court of Appeals for the Seventh Circuit the accompanying written Motion for an Order Staying the Mandate in the above-entitled cause.

Thos. H. Sheridan,
Attorney for Defendant-Appellee.

Service of the foregoing Notice and receipt of a copy of the Motion mentioned therein are hereby acknowledged this 12 day of January, 1948.

Charles J. Merriam,
Attorney for Plaintiff-Appellant.

Endorsed: Filed Jan. 12, 1948. Kenneth J. Carrick, Clerk.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

7th Circuit.

John H. Wallace, Jr.,
Plaintiff-Appellant,
vs.
Mandel Brothers, Inc.,
Defendant-Appellee.
} No. 9261.

MOTION FOR AN ORDER STAYING THE MANDATE OF THIS COURT.

Now comes Defendant-Appellee, Mandel Brothers, Inc., by its attorney, and respectfully moves for the entry of an order staying the mandate of this Court in this cause, pursuant to Rule 25 of the Rules of this Court pending application to the Supreme Court of the United States for a writ of certiorari.

Thos. H. Sheridan,
Attorney for Defendant-Appellee.

Chicago, Illinois
January 12, 1948.

Endorsed: Filed Jan. 12, 1948. Kenneth J. Carrick, Clerk.

And on the same day, to-wit, on the twelfth day of January, 1948, the following further proceedings were had and entered of record, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit

Chicago 10, Illinois.

Monday, January 12, 1948.

Before:

Hon. J. Earl Major, Circuit Judge.

John H. Wallace, Jr., *Plaintiff-Appellant,* vs. Mandel Brothers, Inc., *Defendant-Appellee.*	Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

9261

On motion of counsel for the defendant-appellee, it is ordered that the issuance of the mandate of this Court in this cause be, and the same is hereby, stayed pursuant to Rule 25.

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

I, Kenneth J. Carrick, Clerk of the United States Circuit Court of Appeals for the Seventh Circuit, do hereby certify that the foregoing printed pages contain a true copy of proceedings had and papers filed (excepting the briefs of counsel, and stipulations concerning the filing of the briefs of counsel) in

Cause No. 9261.

John H. Wallace, Jr.,
Plaintiff-Appellant,

vs.

Mandel Brothers, Inc.,
Defendant-Appellee,

as the same remains upon the files and records of the United States Circuit Court of Appeals for the Seventh Circuit.

In Testimony Whereof I hereunto subscribe my name and affix the seal of said United States Circuit Court of Appeals for the Seventh Circuit, at the City of Chicago, this 30th day of January, A. D. 1948.

(Seal)

Kenneth J. Carrick,
Clerk of the United States Circuit Court of Appeals for the Seventh Circuit.

SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed March 15, 1948

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Seventh Circuit is granted, and the case is transferred to the summary docket.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.

PETITION FOR WRIT of CERTIO-RARI

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FEB 9 1948
CHARLES ELMORE CROPLEY
CLERK

IN THE

Supreme Court of the United States

October Term, 1947.
No. 582

MANDEL BROTHERS, INC., a corporation,

Petitioner,

vs.

JOHN H. WALLACE, JR.,

Respondent.

Petition for a Writ of Certiorari to the United States Circuit Court of Appeals for the Seventh Circuit and Brief in Support Thereof.

LEONARD S. LYON,
811 West Seventh Street Building,
Los Angeles 14, California,

THOMAS A. SHERIDAN,
The Field Building,
Chicago 3, Illinois,

Attorneys for Petitioner.

Parker & Company, Law Printers, Los Angeles, Phone TR. 8205.

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IN THE

Supreme Court of the United States

October Term, 1947.
No. .....

MANDEL BROTHERS, INC., a corporation,

Petitioner,

vs.

JOHN H. WALLACE, JR.,

Respondent.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

To the Honorable Fred M. Vinson, Chief Justice, and to the Associate Justices of the Supreme Court of the United States:

Petitioner, Mandel Brothers, Inc., a corporation, respectfully prays that a Writ of Certiorari issue to review a decision of the United States Circuit Court of Appeals for the Seventh Circuit entered December 12, 1947. A Petition for Rehearing was denied on January 6, 1948. The transcript of record in one volume is supplied herewith [Opinion, Tr. pp. 192-199; Decree, p. 200; Order Denying Petition for Rehearing, p. 201].

This petition presents a direct conflict between the decisions of two Circuit Courts of Appeal in patent infringement suits, involving the same patent, as to the validity of that patent. The conflict is between the decision of the Circuit Court of Appeals for the Second Circuit in *Wallace v. F. W. Woolworth Co.*, 133 F.2d 763, and of the Circuit Court of Appeals for the Seventh Circuit in the present suit.

In the first suit filed, the United States District Court for the Eastern District of New York held the patent invalid. This decision was affirmed by the Circuit Court of Appeals for the Second Circuit. In the second and present suit, the United States District Court for the Northern District of Illinois, Eastern Division, also held the patent invalid, but its decision has been reversed by the Circuit Court of Appeals for the Seventh Circuit. In both cases the patent was held infringed if valid.

A direct conflict therefore exists between the Second and Seventh Circuits with respect to the validity of the patent involved. In the Second Circuit, pursuant to the decision of the Circuit Court of Appeals there, the composition purported to be covered by the patent in suit may be sold free of the patent. In the Seventh Circuit the sale of the same composition is held to violate respondent's patent.

Statement of the Case.

The patent involved is No. 2,236,387 [Tr. p. 167], granted on March 25, 1941 to Wallace and Hand for Perspiration Inhibiting Composition. Such a composition containing solutions of aluminum chloride or aluminum sulphate has ability to check the flow of perspiration when applied to the skin. That an anti-respirant composition containing solutions of aluminum chloride or aluminum sulphate was old in the prior art is acknowledged in the patent [Tr. p. 167, ll. 3-7.] While sufficient to check the flow of perspiration, such a composition allegedly tends to develop an acid residue which is corrosive to the clothing with which it may come in contact. The patent proposes to add a neutral amide or amino acid compound (urea being stated as an example) to inhibit the corrosive action of the composition. The particular amide employed commercially by the patentee and by the defendants in both the Second and Seventh Circuit cases is urea. Urea was a common article of commerce before the alleged patented invention and was known as a means for protecting textile fabrics from corrosion by acid. The question posed by the patent is whether it constituted patentable invention to combine urea with the aluminum sulphate and aluminum chloride of the anti-perspirant composition as a means of inhibiting the corrosive action of the composition on clothing.

In holding the patent invalid, the District Court for the Eastern District of New York (*Wallace v. F. W. Woolworth Co.*, 45 F.Supp. 465) found that the action

of urea in inhibiting the acid corrosion of textiles was known in the prior art, particularly the prior art patent to Koch 2,011,292. The District Court found that, in view of this knowledge, the addition of urea to an anti-perspirant composition did not constitute patentable invention. In affirming the decision of the District Court for the Eastern District of New York, the Circuit Court of Appeals for the Second Circuit (133 F.2d 763) found that the property of urea when added to acid to reduce acidity was well known in the prior art, in fact was known to the patentee Wallace before he began any work to inhibit the corrosive action of an anti-perspirant on clothing. It also found that the prior art taught that urea had the ability to inhibit the deleterious effect of acid on fabrics, referring particularly to the prior patents to Koch and Shipp, No. 2,174,534. It concluded that no invention but mere routine laboratory experimentation was involved in the patentee's testing urea to find that urea would do the trick in an anti-perspirant compound, saying:

> "This is a typical case of patient experiment to achieve a useful result. There was no long felt want. As soon as an astringent was used to check perspiration, the acidity of which proved to be excessive, urea was the neutral protective ingredient that about the same time occurred to Wallace, Hand, Killian and Montenier and even before them was known by chemists to protect textiles against acids, as is shown by the patents to Shipp and Koch."

In its decision in the present case the District Court for the Northern District of Illinois, Eastern Division, based its conclusion upon the finding that the prior patent to Shipp "anticipated Wallace and Hand in the discovery of the peculiar effect of urea when combined with an acid" [Tr. p. 143] and that nothing patentable was involved in conducting a simple experiment to prove that urea would have this action in an anti-perspirant cream. In reversing the decision of the District Court in the present case, the Circuit Court fo Appeals for the Seventh Circuit, while not disagreeing that the power of urea to reduce acidity and to inhibit corrosion of textile fabrics by acids was known in the prior art, has based its decision upon the proposition that the textile arts and the anti-perspirant art are not analogous and that the inventors were not bound by what had been known or done in the textile arts. The court disagreed with the finding of the Circuit Court of Appeals for the Second Circuit that there was no long felt want. The court refused to consider the admitted fact that urea had been used by the patent owners in a commercial anti-perspirant cream more than one year prior to the filing of the application for the patent in suit, which anti-perspirant cream had been advertised for sale as being not destructive of cloth, on the ground that the advertisements were not proven to have been those of the patent owners.

Questions Presented.

Petitioner by this petition seeks a review of the following questions:

1. Does the patent in suit exhibit patentable invention in the addition of urea to an anti-perspirant composition to inhibit corrosion of fabrics in view of the prior knowledge of the power of urea to reduce acidity and its ability to inhibit corrosion of fabrics in the presence of acidity?

2. Is the decision of the Circuit Court of Appeals for the Seventh Circuit in the present case correct in ruling that the patentees are not bound by knowledge in the prior art that urea has the ability to inhibit the corrosion of fabrics in the presence of acid?

3. Are the decisions of the courts in the Second Circuit and of the District Court below in the present case correct that, in view of the prior art knowledge in the textile fabric art of the power of urea to inhibit corrosion, a mere routine experiment to determine urea will so act in an anti-perspirant cream does not involve invention?

4. Was the court below correct in the present case in rejecting the defense of anticipation by the admitted sale and advertisement for sale of the prior Arrid containing urea as not destructive to cloth because such advertisements were not shown to have been written by the patent owners?

Reasons Relied on for the Allowance of the Writ.

The power of this Court to grant a Writ of Certiorari is invoked upon the grounds set forth in Rule 38, subdivision 5(b) of this Court, in that the Circuit Court of Appeals for the Seventh Circuit "has rendered a decision in conflict with the decision of another circuit court of appeals on the same matter," to-wit, the Circuit Court of Appeals for the Second Circuit. The conflict affects substantial interests and cannot be resolved otherwise than by a decision of this Court.

Wherefore, your petitioner, Mandel Brothers, Inc., a corporation, prays that this petition be granted and that the aforesaid questions be determined by this Court upon the grant of a Writ of Certiorari to be issued and directed to the Circuit Court of Appeals for the Seventh Circuit.

Dated, Los Angeles, California, February 3, 1948.

MANDEL BROTHERS, INC., a corporation,
By LEONARD S. LYON,
THOMAS A. SHERIDAN,
Attorneys for Petitioner.

IN THE

Supreme Court of the United States

October Term, 1947.

No. .....

MANDEL BROTHERS, INC., a corporation,

Petitioner,

vs.

JOHN H. WALLACE, JR.,

Respondent.

BRIEF IN SUPPORT OF PETITION FOR WRIT OF CERTIORARI.

I.

Opinions in the Courts Below.

The opinion of the Circuit Court of Appeals for the Seventh Circuit in the present case may be found in the Transcript of Record filed herewith [pp. 192-199], and the memorandum opinion of the District Court for the Northern District of Illinois, Eastern Division, in the present case may be found in the Transcript of Record [pp. 141-144], together with a supplemental memorandum [p. 144]. The District Court for the Northern District of Illinois, Eastern Division, entered findings of fact and conclusions of law which may be found in the Transcript of Record [pp. 145-150].

The opinion of the Circuit Court of Appeals for the Second Circuit is reported in *Wallace v. F. W. Woolworth Co.*, 133 F.2d 763, the opinion of the District Court for the Eastern District of New York in that case being reported at 45 F.Supp. 465.

II.

Jurisdiction of This Court.

The jurisdiction of this Court is invoked under Section 240(a) of the Judicial Code (28 U.S.C.A. 347). The petition for rehearing in this case was denied on January 6, 1948.

III.

Statement of the Case.

A statement of the matter involved is set forth in the accompanying petition under the title "Statement of the Case" and requires no elaboration here.

IV.

Argument.

We believe that the error in the decision of the Circuit Court of Appeals for the Seventh Circuit in the present case is apparent in view of the decision of this Court in *Dow Chemical Co. v. Halliburton Oil Well Cementing Co.*, 324 U.S. 320. In that case a patent had been secured on the use of an acid inhibitor with hydrochloric acid to acidize oil wells. The patent was based upon the addition of the acid inhibitor to the acid used in the process. The court found that the inhibitor used in the patent there in suit was well known and numerous patents had been granted for its use in other fields, such as the "pickling" of iron and steel

products in acid solutions and in the transportation of acids in metal containers. In holding the patent invalid, this Court said, at 327:

> "* * * The Grebe-Sanford method; in short, involved in this respect no more than a mere application of an old process of inhibition to a new and analogous use of protecting metal well equipment from corrosion when the well is being acidized to increase production. Such a process lacks the very essence of an invention."

In the *Dow* case the patent covered an active acidic ingredient to which was added a well-known acid inhibitor, the action of which would prevent corrosion of metal while not impairing the desired action of the acid upon limestone. In the case at bar all that Wallace and Hand did was to add a well-known inhibitor of acid to a well-known acidic anti-perspirant constituent to protect garments from corrosive action by the acid while not impairing the anti-perspirant action of the aluminum sulphate or aluminum chloride.

The present case also falls within the scope of the decision of this Court in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, and should be controlled by that decision. In that case the patentee claimed to have invented an ink which would not dry at room temperature but which would dry instantly upon the application of heat after printing. These characteristics of the ink resulted from the nature of the solvent which was one of its components. The solvent selected by the patentee was butyl carbitol. The evidence showed that the patentee was not the discoverer of butyl carbitol but found it mentioned among three solvents in a catalog of

a chemical manufacturer, and when tested by the patentee proved the most satisfactory since it did not dry while on the rollers. In holding the patent in that case invalid, this Court said, at 335:

> "* * * Even assuming that if Gessler had discovered the compound he would be entitled to a patent, he did not discover it. Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put into the last opening in a jig-saw puzzle. * * *"

In the present case the patentees were not the discoverers of urea. All that they did was to select a known material having known properties to meet the known requirements for an anti-perspirant composition. As held by this Court in the *Sinclair & Carroll* case, such a selection does not meet the essential requirement for the validity of a patent; *i.e.*, that the subject-matter display "more ingenuity . . . than the work of a mechanic skilled in the art."

The present case is clearly one calling for the exercise of the power of this Court to issue a Writ of Certiorari to the Circuit Court of Appeals for the Seventh Circuit so that this Court may review the decision of that court and reverse it.

Dated, Los Angeles, California, February 3, 1948.

MANDEL BROTHERS, INC., a corporation,
By LEONARD S. LYON,
THOMAS A. SHERIDAN,
Attorneys for Petitioner.

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Supreme Court of the United States

OCTOBER TERM, 1947.

No. [redacted] 16

MANDEL BROTHERS, INC., a corporation,

Petitioner,

vs.

JOHN H. WALLACE, JR.,

Respondent.

BRIEF FOR PETITIONER.

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STATUTE

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Supreme Court of the United States.

OCTOBER TERM, 1947.

No. 582

MANDEL BROTHERS, INC., a corporation,

Petitioner,

vs.

JOHN H. WALLACE, JR.,

Respondent.

BRIEF FOR PETITIONER.

Opinions of the Courts Below.

The opinion of the Seventh Circuit Court of Appeals in this case holding Wallace and Hand patent No. 2,236,387 [R. 167] valid and infringed is reported in 164 F. 2d 861. This opinion reversed the decision of the District Court for the Northern District of Illinois which had held the patent invalid. The opinion of the District Court in this case appears in the record [R. 141].

In the previous case of *Wallace v. F. W. Woolworth Company*, in the District Court for the Eastern District of New York, the trial court held the same Wallace and Hand patent here in suit to be invalid. The opinion of the trial court is reported in 45 F. Supp. 465. The opinion of the Second Circuit Court of Appeals affirming the decision of the trial court is reported in 133 F. 2d 763.

Jurisdiction.

The opinion of the Seventh Circuit Court of Appeals in this case was filed December 12, 1947 [R. 192], and defendant's petition for rehearing was denied by the Seventh Circuit Court of Appeals on January 6, 1948 [R. 201]. The defendant's petition for certiorari was granted March 15, 1948.

Statement of the Case.

Respondent sued petitioner in the District Court for the Northern District of Illinois, charging infringement of the Wallace and Hand patent No. 2,236,387 [R. 167]. The trial court held the patent invalid for anticipation and lack of invention. The Circuit Court of Appeals reversed its judgment, finding the patent in suit valid and infringed.

In a previous case of *Wallace v. F. W. Woolworth Company*, in the District Court for the Eastern District of New York, the patent was held invalid by the trial court (45 F. Supp. 465), which judgment was affirmed by the Second Circuit Court of Appeals (133 F. 2d 763); and as will appear later, there is a fundamental disagreement in the legal positions of the two courts of appeals on the question of validity on substantially the same records.

The Patent in Suit.

The patent in suit is for a composition which is intended to be applied to certain skin areas to inhibit or retard the flow of perspiration. The composition of the patent consists solely of "solutions containing an acid salt of a heavy metal, usually aluminum chloride or aluminum sulfate" [R. 167, col. 1, ll. 5-7) and "a normally neutral water soluble amino compound possessing one or more

intact reactive amino (NH_2) groups [R. 167, col. 2, ll. 10-13].

The patent in suit acknowledges [R. 167, col. 1, ll. 3-7] that it had been previously proposed to control the flow of perspiration from certain skin areas by the application of solutions containing an acid salt of a heavy metal, usually aluminum chloride or aluminum sulfate. The patent in suit asserts [R. 167, col. 1, ll. 7 to 12] that, although such prior solutions were effective to retard the flow of perspiration, they tended to be corrosive and irritating to the clothing and skin with which they came in contact.

The patent proposes to add to such otherwise old antiperspirant compositions an amino compound for the sole purpose of inhibiting this corrosive and irritating action of the composition. In the antiperspirant compositions sold by the defendant in this case, as well as by the defendants in the prior case of *Wallace v. F. W. Woolworth Company*, the particular amino compound employed is urea. In fact, the record does not contain any evidence of the utility of any other amino compound except urea. Thus, the sole novelty asserted for the composition of the patent in suit consists in the addition to an otherwise old composition of an amino compound such as urea, for the purpose of retarding the corrosive action of the old composition; and the sole question proposed by the patent in suit is whether it constituted a patentable invention to add an amino compound such as urea to an otherwise old antiperspirant composition, for the purpose of inhibiting the corrosive action of the composition.

As will appear hereafter more fully, all of the antiperspirant compositions which have been marked as made under the patent in suit and the "Ever-Dry" antiperspirant herein alleged to be an infringement of the patent in suit

are in the form of a cream rather than a solution. Furthermore, as will hereafter more fully appear, while the patent in suit speaks of the corrosive character of the prior liquid antiperspirant compositions, no one has found it necessary to add urea or similar substances to a liquid antiperspirant composition to eliminate corrosiveness. It is only where an antiperspirant composition is put out in the form of cream that the practical art has found it of any value to utilize such materials as urea to prevent corrosiveness.

While the patent in suit refers to the prior antiperspirant preparations as "solutions," the composition described in the patent in suit is also a solution. The only specific examples of an antiperspirant composition which appear in the patent in suit contain but three ingredients. These three ingredients are: first, aluminum sulfate; second, urea (first example) or glycine (second example); and third, water [R. 168, col. 1, ll. 20-33]. Nothing is contained in the patent in suit to suggest that the invention is of any particular value as employed in the form of an antiperspirant cream, as distinguished from an antispirant solution. In fact, no information is given in the patent in suit as to how to produce a cream, except the general statement that "Our improved compound may also be incorporated in an emulsion with wax or oil and applied to the skin in this form" [R. 168, col. 1, ll. 37-39].

The patented invention includes not only antiperspirant compositions which contain aluminum sulfate or aluminum chloride as the active antiperspirant ingredients, but the patent also includes antiperspirant compositions in which any metallic salt of a strong acid is employed as an antiperspirant ingredient. It includes salts of such metals "as aluminum, zinc, cerium, zirconium, titanium, iron or

bismuth" and states that "salts of tin, lead and cadmium are also effective" and provides that the acid radical of such salts may include "salts of strong organic acids, such as sulfonic acids" [R. 167, col. 2, ll. 17-24].

Furthermore, the claims of the patent in suit do not define and are not limited to any specific composition. Claims 1, 6, 11, 13 and 16 call broadly for a composition in which any acid reacting inorganic salt of a strong acid may be employed. While claims 2, 3, 4, 5, 12 and 15 recite specifically aluminum sulfate and claim 9 recites specifically aluminum chloride, these claims require only that the composition "comprises" or "includes" aluminum sulfate or aluminum chloride, and thus by their terms include any antiperspirant composition in which, in addition to aluminum sulfate or aluminum chloride, the composition may include other antiperspirant materials. This is illustrated by the fact that the commercial products alleged to be made under the patent in suit, such as "Arrid" and "Fresh" are identified in the record merely as products which include respectively aluminum sulfate [R. 117] and aluminum chloride [R. 117] without any identification of what other acid reacting inorganic salts of a strong acid may be present. Furthermore, these claims have been urged and found to be infringed by defendant's Ever-Dry composition which contains three antiperspirant ingredients in the following proportions, *i. e.*, 7% aluminum sulfocarbolate, 7% aluminum sulfate, and 6.6% aluminum chloride [R. 15]. As will later appear, antiperspirant compositions containing urea, aluminum sulfate and cresol sulfonic acid were in public use and on sale more than two years prior to the application for the patent in suit, it being respondent's position that the invention of the patent in suit arose only when they pro-

duced a preparation omitting the cresol sulfonic acid from the composition. It is therefore to be particularly noted that the patent in suit does not claim any specific composition, but is broadly inclusive of at least any antiperspirant composition which includes, in addition to aluminum sulfate or aluminum chloride, urea; independent of the question of whether or not other effective ingredients are also present in the composition. While claim 7 of the patent in suit specifies a specific composition, this claim is not in suit or alleged to be infringed.

Public Use and Sale of the Earlier Arrid Containing Cresol Sulfonic Acid, Aluminum Sulfate and Urea.

The plaintiff and patentee, Wallace, is a manufacturing chemist who in 1932 was doing business under the name of the Wallace Laboratories [R. 113-114]. This continued up to the time of the trial of the case of *Wallace Laboratories v. F. W. Woolworth Company*. Wallace Laboratories has since been incorporated as Wallace Laboratories, Inc., and Wallace is at present vice-president of Wallace Laboratories, Inc. The former Wallace Laboratories developed and manufactured products which were sold by Carter Products, Inc., as a distributor [R. 113].

Previous to 1935 a liquid antiperspirant known as Perstop, which contained aluminum chloride, was manufactured by Wallace Laboratories and sold by Carter Products [R. 120]. Similar liquid antiperspirants have been on the market for some twenty years and sold under the name of "Odorono" [R. 114].

The coinventor of the patent in suit, Hand, was employed by Carter Products in 1935, at which time he and Wallace cooperated together in the investigation of anti-

perspirant compositions [R. 114-115]. Hand conceived of the use of certain cresol sulfonic acids as active antiperspirant ingredients and contemplated marketing an antiperspirant composition containing these materials in the form of a cream. Previous thereto, no antiperspirant composition had ever been marketed in the form of a cream [R. 126]. Wallace and Hand cooperated together in development of this cream. The work of Wallace and Hand on this cream started in the spring of 1935. Immediately they found the cream to be corrosive [Exhibit 9, p. 39]. They at once tried to reduce the acidity by neutralizing with such agents as sodium hydroxide and other strong alkalies [Exhibit 9, pp. 40, 41; R. 128]. When the cresol sulfonic acid was neutralized with sodium hydroxide or other strong alkalies, the corrosive properties were overcome but at the expense of the antiperspirant properties [Exhibit 9, p. 40]. Wallace and Hand then tried urea [Exhibit 9, p. 41; R. 128].

Urea is a well-known chemical compound which was sold in large quantities commercially previous to any alleged invention of the patent in suit. The properties of urea were also well known. The history of the commercial development and properties of urea are fully covered in the two publications, "The Chemistry of Urea" by Werner, defendant's physical Exhibit J, and "Crystal Urea Industrial Development and Properties" by Berliner, defendant's physical Exhibit D. Urea is produced commercially through the reaction of ammonia and carbon dioxide. At ordinary temperatures urea in a solution acts as a weak base or a neutralizer for acids forming addition products thereto [Exhibit D, p. 519]. At more elevated temperatures urea is more completely ionized and therefore active as a stronger neutralizing agent, finally

hydrolizing to give off ammonia [R. 40; see also Exhibit D].

The well-known property of urea to counteract acidity is stated, for example, in Exhibit D, page 518, as follows: "Urea forms additional compounds with acids, acting an as monobasic compound." It required only a simple trial of this well-known weak base to find that it markedly reduced the corrosive action of the cresol sulfonic acid while not reducing the antiperspirant properties as markedly as the sodium hydroxide or stronger alkalies [Exhibit 9, p. 41]. The antiperspirant properties of the cream containing cresol sulfonic acid, however, were considered by Wallace and Hand as insufficient, so to improve the antiperspirant properties they added to the composition aluminum sulfate [R. 124]. By the midsummer of 1935, therefore, Wallace and Hand had produced an antiperspirant composition in the form of a cream which, in addition to cresol sulfonic acid, used urea for the purpose of preventing the corrosive character of the product, and this product also contained aluminum sulfate, aluminum sulfate being present in an amount of about 10% [R. 124]. This material was made by Wallace Laboratories and sold by Carter Products beginning in the midsummer of 1935 and extending until September, 1936 [R. 123]. At least some 30,000 pounds of this material was sold under the trade name of "Arrid" [R. 123].

At the trial petitioner sought to introduce in evidence two advertisements by Carter Products of this earlier Arrid [R. 31, 32, 33, Exhibits A and B], which advertisements show that it was represented that this product was noncorrosive to fabrics. These advertisements were rejected by the trial court on the ground that they were hearsay as to plaintiff Wallace.

Since this earlier Arrid antiperspirant composition was in public use and on sale more than two years prior to the filing on May 3, 1938 of the application for the Wallace and Hand patent in suit [R. 167], the Wallace and Hand patent in suit is totally invalid unless it discloses an invention and is confined to that invention, which invention is separate and distinct from this prior Arrid antiperspirant composition which contained urea and therefore was prior art to the patent in suit.

The Development of the Later Arrid.

In September of 1936 Wallace and Hand made one change only in the earlier Arrid which had been in public use and on sale for more than two years. This change consisted merely in omitting the cresol sulfonic acid and increasing correspondingly the amount of aluminum sulfate present [R. 125, 126]. Respondent has taken the position throughout this litigation that the earlier Arrid which contained cresol sulfonic acid, in addition to aluminum sulfate and urea, was not the invention of the patent in suit, and has taken the position that the later Arrid first produced in September, 1936 is patentably distinct from this earlier Arrid material.

In the prior case of *Wallace v. Woolworth*, respondent sought to distinguish the product produced in September, 1936 (omitting the cresol sulfonic acid) from the prior products by so-called conductivity measurements [Exhibit 9, p. 45]. It was asserted that with salts such as aluminum chloride and aluminum sulfate, urea had no appreciable effect on the conductivity, whereas urea when added to cresol sulfonic acid had an increasing effect on the conductivity [Exhibit 9, pp. 45, 46]. This, it was urged, proved that in the composition containing the cresol

sulfonic acid, the urea was all combined with the acid as "urea methylene dicresol sulfonate" [Exhibit 9, p. 45], while the later compositions omitting the cresol sulfonic acid were asserted to have uncombined urea present.

These conductivity tests and the conclusions of respondent relative thereto are not referred to in the patent and were resorted to initially for use in the prior case of *Wallace v. Woolworth*. No corresponding testimony appears in the record of this case. The only testimony in this case relative to such conductivity tests appears in the cross-examination of petitioner and defendant's witness, de Navarre, who testified that these conductivity tests did not justify the conclusions sought to be drawn therefrom by plaintiff and respondent [R. 81]. It is further to be noted that the distinction sought to be made is not in conformity with the language of the patent in suit. The patent in suit points out that the urea or neutral protective ingredient immediately reacts with the acid on its liberation [R. 168, col. 1, ll. 50-56] and, accordingly, proposes the utilization of just the theoretical quantity of urea to combine with the potential acid ion of the salt employed [R. 167, col. 2, l. 55-R. 168, col. 1, ll. 1-19].

Both the records in this case and in the *Woolworth* case show that the cresol sulfonic acid was omitted from the Arrid compound because it was found that it caused the product to darken in color, resulting in discolorization and, moreover, had the effect of generating bad odors [Exhibit 9, pp. 42, 43; R. 124, 125].

To demonstrate the utility of the composition of the patent in suit, plaintiff introduced evidence of certain ironing tests [R. 13-22]. As to these tests, it is to be noted that even without the addition of urea antiperspirant compositions at room temperatures have little corrosive

action on fabrics. It is only under temperatures corresponding to those reached when garments are ironed that urea is of substantial value [R. 19]. The protection afforded by urea, of course, is not complete, as even with the use of urea customer complaints are received [R. 35]. The statement in the patent in suit that the addition of urea reduces the irritating action of the composition on the skin is not supported in the record. In the prior case, District Judge Byers held:

> "As to the part which the urea plays in arresting skin irritation which would result from application of aluminum sulphate alone, the only direct testimony is by the defendant's witness, Dr. Peck, a practicing dermatologist, who says that, except as to persons having specially sensitive skin, there is no irritation so caused. Since that statement was not contradicted, it must be accepted. It is the only medical as distinguished from chemical testimony in the case, and no reason has been shown for disregarding it.
>
> "The utmost that can be said for the contrary theory, as stated at line 10 of page 1 of the specifications of plaintiff's patent, is that skin-irritant property was ascribed to aluminum sulphate (and chloride) in apparent sincerity, and the addition of urea was deemed to be justified, in part at least, to arrest or overcome that tendency. It cannot be said, however, that there is evidence in the case to vindicate the theory." (45 Fed. Supp. 466.)

The record here is the same [R. 18].

Prior Art Patents Demonstrate That the Power of Urea to Reduce Acidity and Corrosion of Fabrics Was Well Known.

SHIPP No. 2,174,534 [R. 175].

This patent issued on an application filed earlier than the date of invention alleged for the patent in suit. It discloses a process for parchmentizing fabrics consisting in immersing them for short periods in sulfuric acid baths of varying concentrations and it teaches the use of inhibiting the effect which the acid normally has on the fabrics when used in such a process. The patent states [R. 175, col. 1, ll. 8-14]:

> "It is generally known that concentrated sulfuric acid is destructive to textile materials, nevertheless certain uses of sulfuric acids on textiles are so advantageous that endeavors have been made to so treat textiles with sulfuric acid as to obtain the desired effects but to avoid the undesirable effects."

The patent therefore proposes a process for treating cotton fabrics with sulfuric acid "containing an agent which will inhibit the tendering effect of the acid" [R. 175, col. 1, ll. 6-7].

Shipp employed as useful inhibitors the same type of compounds which are described in the Wallace and Hand patent in suit. The patent not only refers particularly to the use of urea, but gives a full description of the use of the same general class of amides and amino compounds which are described in the Wallace and Hand patent in suit [see Shipp patent R. 178, col. 2, l. 55 through p. 5, l. 25]. For some purposes, the patent also points out that such materials as low molecular weight alcohols and ethers

and ketones may be employed, the patent summarizing by saying [R. 175, col. 2, ll. 1-5]:

> "Now it has been discovered that the degrading effect of the acid on the cellulose may be inhibited or retarded by dissolving in the acid certain agents which are termed inhibitors of cellulose degradation."

The trial court found that the action of urea in the invention of the Shipp patent "is quite like the effect produced by adding urea to a cream or solution containing aluminum chloride or aluminum (sulfate) which is to be applied to the skin or come in contact with the fabric" [R. 149, Finding 26]. This finding of fact is not disturbed in the decision of the Seventh Circuit Court of Appeals here on appeal. The Shipp patent contains a disclosure of a test to be applied to determine whether urea is or is not a suitable inhibitor. This test is as follows [R. 175, col. 2, ll. 22-28]:

> "If a cotton fabric is immersed in 96% sulfuric acid at room temperature, removed immediately and rinsed very quickly with a large volume of water, the fabric is disintegrated and destroyed. However, if as much as 25 parts by weight of urea is first added to each 100 parts of acid, then a fabric may be treated with this solution up to 60 seconds without being appreciably tendered."

This test procedure is erroneously referred to in the decision of the Seventh Circuit Court of Appeals as the Shipp process, the Court of Appeals being under the impression that the Shipp process involved only the use of 96% sulfuric acid. Actually, the Shipp patent discloses the use of acids of widely varying strengths from 65% upwardly [see R. 175, col. 2, ll. 42-44]. In one of the examples

of the process of the Shipp patent, *i. e.*, Example 22, the acid used is not a concentrated acid, but only 70% acid [R. 179, col, 1, ll. 69-74].

In connection with the Shipp patent, the Seventh Circuit Court of Appeals comments on the fact that the patentees of the patent in suit found the old antiperspirant solutions "tended to injure the skin by corrosive action and incidentally damaged the fabric of the clothing of the user" (164 F. 2d, at 865). While the patent in suit states that antiperspirant solutions may be irritating to the skin and suggests that the action of urea is to render such solutions harmless to the skin, the record in the case fails to show any improvement in antiperspirant compositions, so far as the damage to the skin of the user is concerned, by the addition of urea. While at the trial elaborate tests were made of the inhibiting action of urea in preventing the corrosion of fabrics in the matter of irritation of the skin, the record is left merely with the statement of plaintiff's expert, Teller, as follows [R. 18]:

> "Q. 14. Is this matter of irritation a universal matter, or does it occur in only a small proportion of cases?
>
> "A. It is not universal. Some people can use these products without any harm. On the other hand, some people can use them for some length of time without any harm and suddenly become sensitive to them."

In the case of *Wallace v. Woolworth*, the District Court points out that the only direct testimony concerning the part urea plays in arresting skin irritation is that by defendant's Dr. Peck, a practicing dermatologist, who says that "except as to persons having specially sensitive skin, there is no irritation so caused." And the trial court concluded that there was no evidence which would vi-

dicate the theory of the patent in suit that the action of urea had any beneficial effect as far as arresting skin irritation.

The action of urea in the Shipp formula is clearly identical with the action of urea in the patent in suit in so far as its inhibiting action is concerned with respect to the corrosion of fabrics. This is fully supported in the testimony at the trial of defendant's expert, de Navarre [R. 46, 47]. Clearly, the trial court was correct in finding that the Shipp patent entirely anticipated Wallace and Hand in the discovery that urea, when combined with acid, would inhibit the corrosive effect of that acid.

MISSBACH No. 2,069,711 [R. 173].

This patent relates to chlorinated hydrocarbons such, for example, as the familiar carbon tetrachloride which is used for dry cleaning of fabrics. The patent points out [R. 173, col. 1, ll. 4-12]:

> "It is known that these materials when exposed to moisture, light, air, and heat, particularly during distillation, as in the case of carbon tetrachloride, decompose with the formation of substances of an objectionable character, usually acidic substances which render the material unsuitable for such purposes as extractions as well as corroding equipment."

The patent further proposes the addition of urea or related amide, for the purpose of stabilizing the chlorinated hydrocarbon and inhibiting the corrosion action thereof on fabrics. The patent states: "Another object of this invention is to provide an effective corrosion inhibitor for use in the presence of halogenated hydrocarbons" [R. 173, col. 1, ll. 24-28]. The patent therefore proposes the addition of 1% or less of urea and points out

that the materials so employed are selected in view of the intended use of carbon tetrachloride in dry cleaning of clothes [R. 173, col. 1, ll. 37-46]. The explanation offered by Missbach of the inhibiting action of urea is as follows [R. 174, col. 1, ll. 15-21]:

> "The stabilizing effect and inhibiting action in corrosion of my inhibitor toward decomposition of the halogen content is, I believe, accomplished thus:— Firstly, they neutralize or remove any acid or acidic substances present; secondly, they retard the production of acid; thirdly, they form a protective film on the surface of the metal."

In its findings, the trial court points out that the Missbach patent fully describes the action of urea as a corrosion inhibitor to prevent damage to fabrics, but holds that this patent does not teach "that urea will inhibit the corrosive effect while leaving the solution sufficiently acid to be astringent" [R. 149].

While the cleaning fluids described in the Missbach patent may have contained insufficient acidic properties to be effective as antiperspirant material (just as the materials of the Shipp patent contain too much acid to be satisfactory for antiperspirant purposes) the anticipating effect of the Missbach patent should not be dismissed on this ground. The patent in suit contains nothing novel concerning the character of acidic solutions which would be effective as an antiperspirant. This is all old and admittedly well known in the art. The only thing the patent in suit purports to teach as novel is that urea will prevent

the corrosive action on fabrics of such admittedly old acid antiperspirant solutions. Admittedly, Missbach teaches this property of urea. Respondent's expert, Teller, admitted at the trial that the inhibiting action of urea as to the corrosion of fabrics by acid solutions was fully disclosed in Missbach [R. 101]. It required, therefore, no invention but a mere trial to discover that urea would have this same action in an antiperspirant preparation.

Koch No. 2,011,292 [R. 171].

This is another patent illustrating the addition of urea to an acidic preparation used in the treatment of textiles or fabrics to prevent corrosion. The patent discloses that certain solutions of aluminum acetate and aluminum formate are employed in the textile industry and suggests the addition thereto of urea (or related compound) to produce stable solutions. The purpose of this addition of urea is described in the patent in these words [R. 171, col. 1, ll. 38-42]:

> "The solutions of these products may be used with special advantage in the textile industry because they do not contain any substances which would have a detrimental effect when used, for instance, for impregnation purposes."

As explained by defendant's expert, de Navarre, the solutions described in the Koch patent are used in the dyeing of textiles, where a corrosive acidic compound would be objectionable as tending to deteriorate cloth [R. 48]. He points out that the urea in the Koch formula

functions as an acid or corrosion inhibitor just as in the patent in suit [R. 48].

Respondent attempted through its expert, Teller, to distinguish from the Koch patent on the ground that the acetates and formates of aluminum were not corrosive to cloth without urea, and therefore sought to assert that urea was added to obtain some other objective. He testified [R. 103]:

> "Q. 65. If the substances were not harmful to the fabric in themselves, why was it advisable to add urea, in your opinion?
>
> "A. I haven't the faintest idea of what he has been trying to do here, unless it would have some effect on dyes that might be very complicated."

The trial court, because of its reliance on the Shipp patent as showing that the action of urea was well known, did not make finding as to the Koch patent. The New York District Court directly found the Koch patent to disclose the same use of urea to mitigate the acids resulting from the reaction in solutions of aluminum salts as in the patent in suit, and therefore held the patent in suit as displaying no patentable invention over the Koch patent (45 Fed. Supp. 465, 467). The Second Circuit Court likewise reverted to, and evidently relied upon, the Koch patent as disclosing an earlier use of urea as a protective ingredient for fabrics to which a solution might be applied.

Specification of Errors Relied Upon.

Petitioner relies upon and urges as error the rulings of the Circuit Court below upon the Questions Presented in the Petition for a Writ of Certiorari (p. 6) in this case, which are:

1. Does the patent in suit exhibit patentable invention in the addition of urea to an antiperspirant composition to inhibit corrosion of fabrics in view of the prior knowledge of the power of urea to reduce acidity and its ability to inhibit corrosion of fabrics in the presence of acidity?

2. Is the decision of the Circuit Court of Appeals for the Seventh Circuit in the present case correct in ruling that the patentees are not bound by knowledge in the prior art that urea has the ability to inhibit the corrosion of fabrics in the presence of acid?

3. Are the decisions of the courts in the Second Circuit and of the District Court below in the present case correct that, in view of the prior art knowledge in the textile fabric art of the power of urea to inhibit corrosion, a mere routine experiment to determine that urea will so act in an antiperspirant cream does not involve invention?

4. Was the court below correct in the present case in rejecting the defense of anticipation by the admitted sale and advertisement for sale of the prior Arrid containing urea as not destructive to cloth because such advertisements were not shown to have been written by the patent owners?

Summary of Argument.

The Seventh Circuit Court of Appeals Clearly Erred in Holding That the Prior Patents Were in an Art Non-analogous to the Patent in Suit.

The decision of the Court of Appeals in this case was predicated upon its ruling that Wallace and Hand were not bound by the teachings of the prior art, on the erroneous ground that the prior patents were lacking in analogy to the patent in suit. Wallace and Hand merely added an inhibitor well known as capable of inhibiting the corrosion of fabrics to an otherwise old antiperspirant, merely for the purpose of securing its well known inhibiting action. This was clearly a completely analogous use of the inhibitor, and this case is directly ruled by the decision of this Court in *Dow Chemical Company v. Halliburton Oil Well Cementing Company* (324 U. S. 320, 89 L. Ed. 973).

The Seventh Circuit Court of Appeals Erred in Not Holding the Patent in Suit Invalid in View of the Public Use and Sale of Antiperspirant Compositions Containing Urea More Than Two Years Before the Filing of the Application for the Patent in Suit.

The application for the Wallace and Hand patent in suit was filed too late to be within the statutory period for the filing of an application since the extensive sale and use of the early Arrid composition more than two years before the filing of the application for the patent in suit was not experimental and barred the patent in suit.

When Wallace and Hand omitted the cresol sulfonic acid from the earlier Arrid composition and increased

correspondingly the percentage of aluminum sulfate, they did not make any invention patentable over the earlier Arrid composition. The patent in suit covers broadly the use of an amino compound such as urea and includes the earlier Arrid as well as the later Arrid composition, and is therefore void as not filed within the statutory period.

The Wallace and Hand Patent in Suit Does Not Exhibit the Exercise of the Inventive Faculties.

No exercise of the inventive faculties but merely the ordinary skill of a chemist is involved in producing the composition of the patent in suit. Not only was the property of urea to protect textiles against acid well known in the textile art, but it was part of the common knowledge of chemists. It was admittedly known to Wallace and Hand before they undertook to produce the patented composition. They at once adopted and used urea when they found a corrosion problem arising in their attempt to produce an antiperspirant cream—substantially contemporaneously therewith the same solution was provided by others.

Nothing more than a simple trial was required to establish the value of urea in an antiperspirant cream. This trial merely confirmed what any chemist would have expected to occur. The law does not permit a conclusion that invention is involved by a mere routine trial of this class which leads to no new or unexpected result.

Long Felt Want and Commercial Success.

This is not a case involving any long felt want.

ARGUMENT.

The Seventh Circuit Court of Appeals Clearly Erred in Holding that the Prior Patents were in an Art Non-analogous to the Patent in Suit.

In holding the patent invalid, the District Court for the Eastern District of New York (*Wallace v. F. W. Woolworth Company*, 45 Fed. Supp. 465) found that the action of urea to inhibit the effect of strong acid salts upon textile fabrics was known in the prior art, particularly in the prior art patent to Koch No. 2,011,292 [R. 171]. The District Court found that, in view of this knowledge, no invention was involved in conceiving that a similar action would be effected by the addition of urea to an otherwise old antiperspirant composition.

In affirming the decision of the District Court for the Eastern District of New York, the Circuit Court of Appeals for the Second Circuit (133 F. 2d 763) found that the property of urea to protect textiles against acids was well known in the art and was, in fact, known to the patentee Wallace before he began any work to inhibit the corrosive action of an antiperspirant on clothing.

It was found that the prior patents to Shipp No. 2,174,534 [R. 175] and Koch No. 2,011,292 [R. 171] each taught that urea had the ability to inhibit deleterious effects of acids on fabrics. It concluded that no invention, but a mere routine laboratory experiment, was involved in the patentee's testing of urea to find that urea would do the same thing in an antiperspirant composition, stating (133 F. 2d at 764):

> "This is a typical case of patient experiment to achieve a useful result. There was no long felt want. As soon as an astringent was used to check perspira-

tion, the acidity of which proved to be excessive, urea was the neutral protective ingredient that about the same time occurred to Wallace, Hand, Killian and Montenier and even before them was known by chemists to protect textiles against acids, as is shown by the patents to Shipp and Koch."

In its decision in the present case, the District Court for the Northern District of Illinois, Eastern Division [R. 141], based its conclusion that the patent was invalid on the finding that the prior patent to Shipp "anticipated Wallace and Hand in the discovery of the peculiar effect of urea when combined with an acid" [R. 143], and that nothing patentable was involved in conducting a simple experiment to establish that urea would have this action in an antiperspirant cream [R. 144].

In reversing the decision of the District Court in the present case, the Court of Appeals for the Seventh Circuit expresses no disagreement with these findings of the District Court for the Eastern District of New York, the District Court for the Northern District of Illinois, or the Second Circuit Court of Appeals, to the effect that the property of urea to reduce acidity and to inhibit the corrosive action of acidic materials on textile fabrics was well known in the prior art. The Court of Appeals for the Seventh Circuit predicates its decision in this case on the erroneous ground that the textile arts, in which this property of urea was well known, is nonanalogous to the art of producing antiperspirant compositions. The Seventh Circuit Court of Appeals in this case predicates its decision on an erroneous statement of a rule of patent law, to the effect that the patentees of the patent in suit

were not bound by what was known or shown in the textile arts, stating [164 F. 2d at 863; R. 195]:

> "It is obviously necessary to determine whether the references lie within the confines of the prior art by which Wallace and Hand were bound, or whether they lie in an art lacking in analogy to antiperspirants."

Consistent with this finding, the court held [164 F. 2d at 865; R. 198]:

> "It would seem obvious from the foregoing announcements that the District Court erred in its conclusion that the patentees were bound by the teachings of the prior art of Shipp."

This decision of the Seventh Circuit Court of Appeals was clearly an error. When it became apparent to Wallace and Hand that their antiperspirant composition in the form of a cream was corrosive to fabrics, it is axiomatic that the logical place to look for a solution of such a problem was in the art of handling fabrics. To hold that Wallace and Hand, when they found that a cream was corrosive to fabrics, were not bound by what was known in the art of handling fabrics to prevent corrosion is not only clearly illogical and unsound, but directly contrary to the latest decision on this subject by this Court.

In *Dow Chemical Company v. Halliburton Oil Well Cementing Company* (324 U. S. 320 at 327, 89 L. Ed. 973, at 979) this court held:

> "All the Grebe-Sanford process taught was the obvious fact that hydrochloric acid could be inhibited to prevent corrosion while being used to dissolve limestone rock pursuant to the Frasch method of acidizing wells. * * * No new or unexpected

results were obtained by the addition of such an inhibitor. It was perfectly plain to an expert that the metal well equipment would thereby be protected from corrosion. The Grebe-Sanford method, in short, involved in this respect no more than a mere application of an old process of inhibition to a new and analogous use of protecting metal well equipment from corrosion when the well is being acidized to increase production. Such a process lacks the very essence of an invention."

In the *Dow v. Halliburton* case, the particular inhibitors used by the Grebe-Sanford patent were arsenic compounds. Such inhibitors had been used extensively in the commercial pickling of iron and steel products in acid solutions, and in the transportation of acids in metal containers.

The analogy between the facts of the *Dow v. Halliburton* case and the case at bar is clear. In the *Dow v. Halliburton* case the process of acidizing a well without the use of an inhibitor was old in the art. In the case at bar the antiperspirant solutions of the patent in suit omitting the inhibitor were old and well known in the art. In *Dow v. Halliburton* the arsenic compounds employed as inhibitors in the patent in suit were well known in the iron and steel art, whereas, in the case at bar the inhibitor of the patent in suit, urea (and related compounds), was well known in the art of treating and cleaning fabrics.

The Wallace and Hand patent, in short, involves no more than a mere application of the old process of inhibition of fabrics by the use of urea to the new and analogous use of inhibiting corrosion of fabrics in the utilization of antiperspirant compositions. No new and unexpected results were obtained by the addition of such an inhibitor.

In the *Dow v. Halliburton* case the rule was applied, although some 36 years elapsed between the issue of the Frasch patent in 1898 disclosing the acidizing process and the issue of the Grebe-Sanford patent in 1932 disclosing the addition of the inhibiting compounds. In the present case, the adoption of urea to inhibit the corrosion of fabrics followed substantially immediately as soon as it was found that antiperspirant compositions in the form of a cream were corrosive to fabrics, and the record shows that the same idea of using urea to prevent corrosion of fabrics and in antiperspirant compositions occurred substantially simultaneously to others.

In support of its decision that the use of urea as an acid inhibitor in an antiperspirant composition was non-analogous to the use of urea as an acid inhibitor in the art of handling fabrics, the Seventh Circuit Court of Appeals relies principally on decisions of the Seventh Circuit such as *A. J. Deer Co. Inc. v. U. S. Slicing Machine Co.*, 21 F. 2d 812, and *Copeman Laboratories Co. v. General Plastics Corporation*, 149 F. 2d 962, but makes a most obvious misapplication of the language even of these decisions. In *A. J. Deer Co. Inc. v. U. S. Slicing Machine Co.*, the court states (21 F. 2d at 813):

> "We are of opinion that whether arts or uses are analogous depends upon the similarity of their elements and purposes. If the elements and purposes in one art are related and similar to those in another art, and because and by reason of that relation and similarity make an appeal to the mind of a person

having mechanical skill and knowledge of the purposes of the other art, then we are of opinion that such arts must be said to be analogous, and, if the converse is true, they are nonanalogous arts."

Clearly; in the present case the elements under consideration are acidic solutions and urea as an inhibitor of the action of those acidic solutions on fabrics. The similarity of the elements and the similarity of the purposes of the inhibitor is complete. Certainly no chemist familiar with the use of urea for inhibiting the corrosion of fabrics in the fabric art, as shown, for example, by the Shipp patent, the Koch patent and the Missbach patent, would fail to receive a suggestion that urea would accomplish the same purpose in an antiperspirant composition. This Court in *Cuno Engineering Corp. v. Automatic Devices Corp.*, 314 U. S. 84 at 91, 86 L. Ed. 58 at 63, stated:

"A new application of an old device may not be patented if the 'result claimed as new is the same in character as the original result' (Blake v. San Francisco, 113 US 679, 683, 28 L ed 1070, 1072, 5 S Ct 692) even though the new result had not before been contemplated. Pennsylvania R. Co. v. Locomotive Engine Safety Truck Co., 110 US 490, 494, 28 L ed 222, 223, 4 S Ct 220 and cases cited."

In this case the inhibiting agent, urea, has only this old purpose and effect of reducing the corrosive action of the acid incident to its contact with fabrics; it has no effect upon the action of the acid in retarding the flow of perspiration.

In *Grinnell Washing Mach. Co. v. Johnson Co.*, 247 U. S. 426 at 432-4, 62 L. Ed. 1196 at 1199, this Court states:

> "* * * Merely bringing old devices into juxtaposition, and there allowing each to work out its own effect without the production of something novel, is not invention. No one by bringing together several old devices without producing a new and useful result, the joint product of the elements of the combination and something more than an aggregate of old results, can acquire a right to prevent others from using the same devices, either singly or in other combinations, or, even if a new and useful result is obtained, can prevent others from using some of the devices, omitting others, in combination.' Hailes v. Van Wormer, *supra*. (20 Wall. 353, 368)."

Having quoted this statement of this general principle, this Court in that case proceeds (247 U. S. at 433, 62 L. Ed. at 1200) to further clarify it:

> "Applying the rule thus authoritatively settled by this court, we think no invention is shown in assembling these old elements for the purposes declared. No new function is 'evolved from this combination;' the new result, so far as one is achieved, is only that which arises from the well-known operation of each one of the elements."

Germer Stove Co. v. Art Stove Co., 150 Fed. 141 at 145 (C. C. A. 6), applied this rule of want of invention, saying:

> "Germer has done no more in his first claim than to unite the Condit fire pot with a grate in which the

amount of air might be controlled by a damper. There is nothing new in his fire pot, for it is the fire pot of Condit. There is no invention in his grate, for grates in which the supply of air may be regulated were not new. The claim covers a mere aggregation of elements, the fire pot and the fire grate each producing its own effect after as before the combination, each operating in the combination as it did before. The mere bringing together of old parts and allowing each to work out its own old effect, without producing some new product or result as a consequent of the union and co-operating action, is a mere mechanical juxtaposition. Goodyear Tire & Rubber Co. v. Rubber Tire Wheel Co., 116 Fed. 363, 370, 53 C. C. A. 583; Overweight Counterbalance Elevator Co. v. Henry Voight Mach. Co., 102 Fed. 957, 43 C. C. A. 80."

Respondent cannot be aided here by stressing the fact that urea was first used in an antiperspirant composition. As stated by this Court in *Dow v. Halliburton* (342 U. S. 320 at 328, 89 L. Ed. 973 at 980):

"He who is merely the first to utilize the existing fund of public knowledge for new and obvious purposes must be satisfied with whatever fame, personal satisfaction or commercial success he may be able to achieve. Patent monopolies, with all their significant economic and social consequences, are not reserved for those who contribute so insubstantially to that fund of public knowledge."

The Seventh Circuit Court of Appeals Erred in Not Holding the Patent in Suit Invalid in View of the Public Use and Sale of Antiperspirant Compositions Containing Urea More Than Two Years Before the Filing of the Application for the Patent in Suit.

Congress has in express terms limited the inventions for which a patent may be obtained by an inventor to those "not in public use or on sale in this country * * * more than two years* prior to his application"(35 U. S. C. §31). Accordingly, if an invention has been in public use or on sale in this country more than two years prior to the application, the right to obtain a patent is lost. (*Root v. Third Ave. R. Co.,* 146 U. S. 210, 36 L. Ed. 946; *Andrews v. Hovey,* 123 U. S. 267, 31 L. Ed. 160; *Smith, & Griggs Mfg. Co. v. Sprague,* 123 U. S. 249, 31 L. Ed. 141; *Manning v. Cape Ann Isinglass, etc. Co.,* 108 U. S. 462, 27 L. Ed. 793; *Hall v. Macneale,* 107 U. S. 90, 27 L. Ed. 367; *Worley v. Loker Tobacco Co.,* 104 U. S. 340, 26 L. Ed. 821; *Egbert v. Lippmann,* 104 U. S. 333, 26 L. Ed. 755; *Elizabeth v. American Nicholson Pav. Co.,* 97 U. S. 126, 24 L. Ed. 1000; *Consolidated Fruit Jar Co. v. Wright,* 94 U. S. 92, 24 L. Ed. 68; *McClurg v. Kingsland,* 1 How. (U. S.) 202, 11 L. Ed. 102.)

Use of an invention by or under control of the inventor for the purpose of determining whether the invention is complete or requires modification or change before final adoption does not place the invention in public use within the meaning of the statute. (*Smith & Griggs Mfg. Co. v. Sprague,* 123 U. S. 249, 31 L. Ed. 141; *Beedle v. Bennet,*

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*Amended by Act of Aug. 5, 1939, 53 Stat. 1212, to read "one year" instead of two years.

122 U. S. 71, 30 L. Ed. 1074; *Elizabeth v. American Nicholson Pav. Co.*, 97 U. S. 126, 24 L. Ed. 1000; *Kendall v. Winsor*, 21 How. (U. S.) 322, 16 L. Ed. 165.) To come within this rule, the main purpose of the use must be to enable the inventor to determine whether the invention is complete or requires modification or change before final adoption (*Smith & Griggs Mfg. Co. v. Sprague*, 123 U. S. 249, 31 L. Ed. 141). The rule has no application where the use, although originally for the purpose of experiment, is continued for a longer period than is reasonably necessary to determine whether the invention is complete or requires further modification or change. (*Root v. Third Ave. R. Co.*, 146 U. S. 210, 36 L. Ed. 946; *Manning v. Cape Ann Isinglass, etc., Co.*, 108 U. S. 462, 27 L. Ed. 793; *Hall v. Macneale*, 107 U. S. 90, 27 L. Ed. 367; *Worley v. Loker Tobacco Co.*, 104 U. S. 340, 26 L. Ed. 821.) To bring a use or sale within the exception made in favor of experimental use or sale, there must be evidence both of the need and of the fact of experimentation, and the burden of proof is upon the patentee to establish that the public use or sale was experimental within the exception to the rule (*Grand Rapids Showcase Co. v. Measuregraph Co.*, 28 F. 2d 497 (C. C. A. 8)), the presumption being that the use or sale is not experimental (*American Ballast Co. v. Davy Burnt Clay Ballast Co.*, 220 Fed. 890).

> "The thing implied as excepted out of the prohibition of the statute is a use which may be properly characterized as substantially for purposes of experiment. Where the substantial use is not for that purpose, but is otherwise public, and for more than two years prior to the application, it comes within the prohibition." (*Smith & Griggs Mfg. Co. v. Sprague*, 123 U. S. 249, 31 L. Ed. 141 at 143.)

"That it was capable of improvement need not be denied, nor that, while it was in daily use, its owner and inventor watched it with the view of devising means to meet and overcome imperfections in its operation; but this much can be said in every such case. There are few machines, probably, which are not susceptible of further development and improvement, and the ingenuity of mechanics and inventors is commonly on the alert to discover defects and invent remedies. The alterations made in the machine in question, however useful, were not vital to its organization. Without them, it could and did work so as to be commercially successful." (*Id.*, 31 L. Ed. at 146-7.)

Clearly the Seventh Circuit Court of Appeals erred in dismissing this defense on the ground that the sale of the antiperspirant composition containing 10% aluminum sulfate, urea and cresol sulfonic acid and cream forming constituents [R. 124] by Wallace and Hand was merely experimental. Some 30,000 pounds of this material were sold by Carter Products beginning in the summer of 1935 and extending until September, 1936 [R. 123]. The advertisements of Carter Products relative to this material were rejected by the trial court as not the advertisements of the plaintiff Wallace. Yet, it was ruled that these sales by Carter Products were the mere experiments of the inventors, Wallace and Hand. There is no evidence in the record and there was no attempt made by plaintiff at the trial to show that the purpose of these sales was for experimentation. This is not a case where there was a single use or a single sale, but a continued succession of sales in the ordinary course of business, with the sole motive of obtaining the profits ordinarily derived from

trade. Clearly, under the authorities given above, the anticipating effect of this earlier Arrid material on the patent in suit should not be dismissed on the ground that it was a mere experimental use.

Nor does the record sustain the decision of the Seventh Circuit Court of Appeals that the evidence concerning the prior use and sale of this earlier Arrid material was largely excluded by the trial court. On the contrary, as we have shown, the facts appear uncontradicted in the testimony of the plaintiff himself. The only evidence excluded was the offered advertisements of Carter Products. Even if, despite the close connection between Carter Products and the plaintiff and patentee as shown by the record, the trial court was correct in finding such advertisements were hearsay as regards Wallace, the defense is completely established. The advertisements were offered merely to show that it was represented that these materials were noncorrosive. It may well be that the later products were less corrosive, but the undisputed facts in the evidence are that urea was added to this earlier composition to reduce the corrosive action and that, in fact, it did reduce the corrosive action.

Clearly, if there were any invention to be made over the prior patent art in conceiving that urea was useful to prevent corrosion of fabrics in antiperspirant compositions, this invention was embodied in this earlier Arrid antiperspirant composition and, therefore, such invention cannot be utilized to sustain the patent in suit. All that was done in September, 1936 by Wallace and Hand was merely to omit the cresol sulfonic acid and increase the percentage of aluminum sulfate from 10 to 20. If this change constituted an invention, it certainly was not the discovery of the value of urea and, moreover, it is not

the invention described or sought to be patentable in the patent in suit. The patent in suit is predicated on the broad statement that the objects of the invention of the patent are carried out by the addition of an amino compound, such as urea, to any heavy metal salt of a strong acid [R. 167, col. 2, ll. 7-13]. The patent is not limited to antiperspirant compositions containing as the sole ingredient aluminum sulfate as distinguished from antiperspirant compositions containing sulfonic acids as well as aluminum sulfate. In fact, the patent expressly states: "* * * salts of strong organic acids, such as sulfonic acids, may also be used" [R. 167, col. 2, ll. 23-24]. Thus, the patent by its own terms expressly includes the earlier Arrid composition in public use and on sale more than two years before the application was filed.

Furthermore, the claims of the patent in suit are broadly inclusive. Claims 1, 6, 11, 13, 14 and 16 in suit cover broadly any acid reacting inorganic salt of a strong acid, while claims 2, 3, 4, 5, 12, and 15 recite specifically aluminum sulfate, and claim 9 recites specifically aluminum chloride. These claims cover any compound which comprises or includes aluminum sulfate or aluminum chloride, and thus by their terms cover compositions in which, in addition to aluminum sulfate, the antiperspirant preparation includes metallic salts of sulfonic acids. This is illustrated by the fact that the composition of petitioner, which is herein held to constitute an infringement of each and all of the claims in suit, contains 7% aluminum sulfocarbolate, 7% aluminum sulfate, and 6.6% aluminum chloride [R. 15]. Thus petitioner's antiperspirant composition contains less aluminum sulfate than the early Arrid in public use and on sale more than two years before the filing of the patent in suit.

Clearly the invention attributed to the patent in suit by the Seventh Circuit Court of Appeals, and the only invention described in the patent in suit, was in public use and on public sale by the patentees more than two years before they applied for the patent in suit, and the patent is therefore void.

The Wallace and Hand Patent in Suit does not Exhibit the Exercise of Inventive Faculties.

In order to sustain the patent in suit, it is not only necessary that the subject matter of the patent be novel, but it is further necessary that the production of that subject matter require the exercise of the inventive faculties as distinguished from mere ordinary chemical skill. No such invention was involved in producing the patented composition.

The property of urea to protect textiles against corrosion from acid was not only well known in the textile art, as shown by the prior patents to Koch, Shipp and Missbach, but this property of urea was the common knowledge of all ordinarily skilled chemists. Even if Wallace and Hand had been the first discoverers of this property of urea they could not have patented it (*Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 92 L. Ed. Ad. Op. 414, decided by this Court February 16, 1948). The record shows that before they made any test at all on the use of urea, the patentees were fully familiar with this property of urea [R. 127]. In the *Woolworth* case the witness for the plaintiff, Killian, likewise showed that this property of urea was one well known to the ordinary chemist [Exhibit 9, pp. 27, 28]. As soon as Wallace and Hand experimented with an antiperspirant cream that was corrosive, the thought of using urea to prevent that

corrosion substantially immediately occurred to them. It likewise substantially contemporaneously occurred to others. The proceedings in the Patent Office leading to the grant of the patent in suit shows that before it was granted an interference was declared between the application for Wallace and Hand and applications of two other persons, Jules B. Montenier and W. Kedzie Teller [Exhibit 9, pp. 318-319].

This Court has repeatedly held that where substantially as soon as a problem arises the same expediency is used to solve that problem, not only by the patentee, but substantially contemporaneously by others, such facts establish that mere mechanical or chemical skill, as distinguished from invention, is involved in the adoption of such an expediency. Thus in *Concrete Appliances Company v. Gomery*, 269 U. S. 177 at 185, 70 L. Ed. 222 at 226-7, this Court held:

> "It is but 'the suggestion of that common experience, which arose spontaneously and by a necessity of human reasoning, in the minds of those who had become acquainted with the circumstances with which they had to deal.' Hollister v. Benedict Mfg. Co., 113 U. S. 59, 72, 28 L. ed. 901, 905, 5 Sup. Ct. Rep. 717. This progressive adaptation, much of which preceded and some of which was co-temporaneous with the Callahan adaptation, of well known devices to new but similar uses, 'is but the display of the expected skill of the calling, and involves only the exercise of the ordinary faculties of reasoning upon the materials supplied by a special knowledge, and the facility of manipulation which results from its habitual and intelligent practice.' Hollister v. Benedict Mfg. Co., *supra*, at page 73 (28 L. ed. 905, 5 Sup. Ct. Rep. 717). No novel elements were used by Callahan in

his device. We are unable to find that their use in combination in it was more than the application to them of mechanical skill in the course of a mutual development and expansion of the art."

The Second Circuit Court of Appeals was clearly correct in holding in the *Woolworth* case (133 F. 2d at 764):

"This is a typical case of patient experiment to achieve a useful result. There was no long felt want. As soon as an astringent was used to check persipration, the acidity of which proved to be excessive, urea was the neutral protective ingredient that about the same time occurred to Wallace, Hand, Killian and Montenier, and even before them was known by chemists to protect textiles against acid, as is shown by the patents to Shipp and Koch."

Not only had the thought of using urea occurred to the patentees Wallace and Hand substantially immediately after they found that their antiperspirant cream was corrosive, but once this thought had occurred to them it required merely a trial to find that urea accomplished the purpose. This trial led to no new discovery nor to any unexpected result. Wallace and Hand by this trial merely confirmed what the ordinary routine knowledge of the chemist led them to expect would occur. Inventions do not arise by any such process. The mere routine work of an investigator involving no imagination does not constitute invention. This rule is well illustrated by the decision of the Second Circuit Court of Appeals in this case and the decisions therein cited. The Second Circuit Court of Appeals was clearly correct in holding (133 F. 2d at 764):

"We have repeatedly held that skillful experiments in a laboratory, in cases where the principles of the

investigations are well known, and the achievement of the desired end requires routine work rather than imagination, do not involve invention. Ruben Condenser Co. v. Aerovox Corporation, 2 Cir., 77 F. 2d 266, 267; Ruben Condenser Co. v. Copeland Refrigeration Corp., 2 Cir., 85 F. 2d 537, 541; Fink v. V. Foscato, Inc., 2 Cir., 79 F. 2d 842, 843; Claude Neon Lights, Inc., v. Rainbow Light, Inc., 2 Cir., 90 F. 2d 959, 962."

When Wallace and Hand were led by their previous knowledge of the properties of urea to expect that as applied to antiperspirant compositions these same properties would be useful, they clearly merely confirmed in a routine manner (by a process well known to all chemists) what they had already anticipated. They made no discovery, the process involved no imagination or no exercise of the inventive powers. It cannot therefore be said that the patent in suit involves any invention.

Long Felt Want and Commercial Success.

Evidence that a machine, process or composition of matter has fulfilled a long felt want or need and was commercially successful may be referred to only if all the other proof in the case leaves the question of invention in doubt. In *Slip Scarf Co. v. Wm. Filene's Sons Co.*, 289 Fed 641, the First Circuit Court of Appeals affirmed the refusal of the trial court to give requests Nos. 20 and 21, relating to the jury's taking into consideration, on the question of invention, the difficulties existing before the invention that were overcome by the patented invention, that it filled a want not adequately filled before, that it became public and went into extensive use, that the trade acquiesced in the patent by taking licenses, etc.,

and that others had tried and failed to meet the difficulties, saying, at 649:

> "The rule is that the class of evidence above referred to is to be made use of in determining the question of invention only in a doubtful case. Duer v. Corbin Cabinet Co., 149 U. S. 216, 13 Sup. Ct. 850, 37 L. Ed. 707; McClain v. Ortmayer, 141 U. S. 419, 429, 12 Sup. Ct. 76, 35 L. Ed. 800; American Salesbook Co. v. Carter-Crume Co. (C. C.) 125 Fed. 499."

Here the question is not open to doubt. There is no evidence in the record here that will sustain a finding that the composition of the patent in suit fulfilled any long felt want. This is not a case involving a long felt want but quite the opposite thereto. It is a case where a problem was immediately solved as soon as it arose. Wallace and Hand were the first to attempt to market an antiperspirant cream [R. 126]. Only the antiperspirant creams marketed have used urea to prevent corrosion. As we have shown, within a very short period of time after finding antiperspirant creams produced corrosion, urea was adopted by Wallace and Hand and substantially contemporaneously by others. The Court of Appeals in the *Woolworth* case quite correctly ruled: "There was no long felt want."

In this case the Court of Appeals held [R. 193]:

> "In this respect, the evidence is convincing that Wallace's composition was tremendously successful commercially. We think, too, that the evidence discloses clearly an existing public demand for a compound possessing the desirable qualities mentioned and a fulfillment of that demand by the patented product."

There is no evidence in the record which can sustain this conclusion of the Court of Appeals. The record

shows that for some twenty years previous to the patent in suit liquid antiperspirant compositions were successfully marketed without using any such material as urea to prevent corrosion, and that subsequent to the patent in suit they continued in successful competition with the patent in suit, such products being even sold by Carter Products up through the time of the trial of the case below.

The patentee, Wallace, testified [R. 119, 120]:

"XQ 79. In the anti-perspirant Perstop to which you have referred, you relied upon aluminum chloride as the astringent constituent, is that correct?

"A. We did.

"XQ 80. There was no urea incorporated?

"A. There was not.

"XQ 81. That was in stick form?

"A. Perstop was a solution of aluminum chloride.

"XQ 82. Typical of those which had been used before generally in the art?

"A. Yes.

* * * * * * * * *

"XQ 85. Over what period of time?

"A. I believe it has been on the market since 1934.

"XQ 86. And is still on the market?

"A. It is still on the market.

"XQ 87. And it is being sold by Carter Products?

"A. It is.

"XQ 88. As an anti-perspirant liquid?

"A. Yes.

"XQ 89. That contains no urea?

"A. It contains no urea.

"XQ 90. Is there any so-called protective ingredient incorporated in Perstop?

"A. There is not."

There is no evidence in the record that anyone familiar with the liquid antiperspirant compositions on the market previous to the alleged invention of the patent in suit ever found any necessity for reducing the corrosive character of those compositions or ever tried to so do or ever failed in trying to so do. There is no evidence in the record that anyone having knowledge of these prior antiperspirant compositions and knowledge of the use of urea as an inhibitor of the corrosive action ever attempted to, or failed to successfully produce an antiperspirant composition in which urea was used to reduce the corrosive character of such antiperspirant compositions. In the absence of such proof, the doctrine of fulfillment of a long felt want is not applicable to these cases. To bring a case within the doctrine of long felt want, it is necessary to show that those familiar with the relative prior art were unable to solve the existing problem. As said by this Court in *Toledo Pressed Steel Co. v. Standard Parts*, 307 U. S. 350 at 356, 83 L. Ed. 1334 at 1338: "But it does not appear that either was familiar with the relevant prior art."

Patentable novelty, originality or invention cannot be ascribed to the use of that which was in fact public knowledge. The long commercial sale of such liquid antiperspirant compositions as Perstop and Odorono [R. 114] has made these antiperspirant compositions part of the public knowledge. The prior patents to Shipp, Koch and Missbach had made the use of urea as an inhibitor part of the public knowledge. Lack of knowledge of these patents and publications cannot remove them from the

public domain. Nor would the fact, if true, that Wallace and Hand were ignorant of these prior patents make them the original and first inventors thereof under the patent statute. Their invention was anticipated because it was part of the public knowledge.

> "Bone may have been ignorant of them and his device may not have been their suggestion. They seem to have been unknown to American engineers, not even the interest of the controversy in the sixth circuit having developed their existence. From this local ignorance nothing can be deduced favorable to the patent. Its device having been described in printed publications, although in foreign countries, patentable novelty or originality cannot be asserted for it. Rev. Stat. Sec. 4886, Act of March 3, 1897, 29 Stat. at L. 692, chap. 391, Comp. Stat. Sec. 9430, 7 Fed. Stat. Anno. 2d ed. p. 23. Such is the provision of the law, and we cannot relax it in indulgence to what may seem the individual's merit." (*Bone v. Marion County*, 251 U. S. 134 at 144, 64 L. Ed. 188 at 193.)

See further *Tashjian v. Forderer Cornice Works*, 14 F. 2d 414, 415 (C. C. A. 9); *Ironclad Mfg. Co. v. Dairyman's Mfg. Co.*, 143 Fed. 512, 513 (C. C. A. 2); *Fry v. Rookwood Pottery Co.*, 90 Fed. 494.

> "Entirely irrespective of the matter of use, a man is not entitled to the reward given inventive genius, if his invention had theretofore been disclosed to the public through the public records of the Patent Office. The statute rewards invention, and not diligence in unearthing prior patents which have not been turned

into commercial success." (*W. H. Butcher Packing Co. v. Cincinnati B. S. Co.*, 35 F. 2d 567 at 569 (C. C. A. 10).)

Although the proof established that the Simmons patented method actually filled a long felt want (Cf. 98 F. 2d 436 at 439-40), this Court, in *Honolulu Oil Corp. v. Halliburton*, 306 U. S. 550 at 554, 562, 83 L. Ed. 980 at 983, 987, held the Simmons patent anticipated by the Franklin patent, although there was no proof that anyone had ever used the Franklin device for the performance of the Simmons method and although the description in the Franklin patent was "to control flow and not to test productivity of strata reached before completion of wells (p. 562). This Court said of the Franklin device:

> "Plainly, it may be used as a tester; for by its use the contents of the producing stratum, sealed off from the rest of the well and unimpeded in its entry into the rat-hole by pressure of the rotary mud, can be brought undiluted to the surface by a mechanism almost duplicating that shown by the patent in suit." (p. 554.)

In the case at bar—as it did in the *Woolworth* case—plaintiff stresses commercial success of the method practised by plaintiff as evidence that invention was required to produce the composition of the patent in suit. Commercial success is not proof of invention. (*Lempco Products v. Timken*, 110 F. 2d 307 (C. C. A. 6); *American Fruit Growers v. Brogdex*, 283 U. S. 1, 75 L. Ed. 801; *Bulldog Elec. Prod. Co. v. General Elec. Co.*, 105

F. 2d 466, 468-9 (C. C. A. 4).) The commercial success of the composition of the patent in suit was due to the preference of the trade for a product in the form of a cream and to the extensive advertisements thereof [R. 125, 131]. All that plaintiff has established is that he has sold large quantities of the composition of the patent in suit by means of extensive advertisements. Urea was the natural buffer to add to reduce the corrosion of acidic antiperspirant compositions [Exhibit 9, p. 26]. These properties are well known.

> "Articles of manufacture may be new in the commercial sense when they are not new in the sense of the patent law." (*Union Paper Collar Co. v. Van Deusen,* 23 Wall. 530, 23 L. Ed. 128 at 133.) "The fact that the patented article has gone into general use is evidence of its utility, but not conclusive of that, and still less of its patentable novelty. *McClain v. Ortmayer,* 141 U. S. 419, 425 (35:800, 802) and authorities there cited." (*Grant v. Walter,* 148 U. S. 547 at 556, 37 L. Ed. 552 and 557.)
>
> "Nevertheless commercial success is an unsafe guide to invention unless prior efforts to fill the space be shown (National, etc., Co. v. Bissell, etc., Co., 249 Fed. 196, 161 C. C. A. 232); and when they are shown, it is not infrequently found that the faculty of invention was not necessary to fill whatever vacancy existed." (*Boston Pencil Pointer Co. v. Automatic Pencil Sharpener Co.,* 276 Fed. 910 at 911-12 (C. C. A. 2).)

Conclusion.

It is respectfully submitted that the decision of the Seventh Circuit Court of Appeals sustaining the patent in suit on the ground that the patentees were not bound by the prior knowledge of the properties of urea in the fabric art was clearly erroneous and that the patent in suit should be declared invalid upon the ground that the use of urea to prevent corrosion of fabric was merely a well known expedient in the art, and for the further reason that the application for the patent was not filed within the statutory period.

Respectfully submitted,

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IN THE

Supreme Court of the United States

OCTOBER TERM, 19~~47~~ 48

No. ~~582~~ 16

MANDEL BROTHERS, INC., A CORPORATION,
Petitioner,

vs.

JOHN H. WALLACE, JR.,
Respondent.

BRIEF OF RESPONDENT IN OPPOSITION TO PETITION FOR WRIT OF CERTIORARI.

CHARLES J. MERRIAM,
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Attorneys for Respondent.

IN THE

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MANDEL BROTHERS, INC., A CORPORATION,
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vs.

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BRIEF OF RESPONDENT IN OPPOSITION TO PETITION FOR WRIT OF CERTIORARI.

To the Honorable Chief Justice and Associate Justices of the Supreme Court of the United States:

SUPPLEMENTAL STATEMENT OF THE MATTER INVOLVED.

While there is a conflict between the decision of the Second Circuit Court of Appeals and that of the Seventh Circuit Court of Appeals as to the validity of Wallace and Hand patent No. 2,236,387, the two decisions were upon fundamentally different records in respect to the question of long felt want.

No effort was made in the New York case to prove long felt want, whereas a showing was made and accepted in the Seventh Circuit case of the existence of a long felt want for a non-corrosive antiperspirant.

The statement, therefore, on page 5 of the Petitioner's brief that the Second and Seventh Courts of Appeal disagreed as to the existence of long felt want would not necessarily have been true if the same record had been before each court. Certainly the Seventh Circuit Court would have found no long felt want if it had had before it only the record presented to the Second Circuit Court. Likewise, we believe it equally clear that the Second Circuit Court of Appeals would have found long felt want if it had had the record before the Seventh Circuit Court.

It is conceded that the use of urea to overcome or neutralize acidity was long known. What the Court of Appeals for the Second Circuit overlooked was that thousands of other materials had the same ability. The difficulty was that an antiperspirant required acidity in order to function, and no one prior to Wallace and Hand had solved the dilemma presented by the necessity of overcoming the bad effects of acidity while retaining acidity and its good effects.

We therefore do not regard any of the alleged questions presented by Petitioner as being fairly involved in a review. One Court did hold the patent valid and the other Court held the patent invalid, on a different record.

Petitioner does not charge that the Second Circuit Court of Appeals would have held the patent invalid if it had had before it the record upon which the Seventh Circuit Court based its decision. In such circumstances we find no conflict which need be resolved in the Supreme Court.

Petitioner also charges a conflict between the decision

of the Seventh Circuit Court of Appeals and the decisions of this Court in *Dow Chemical Co.* v. *Halliburton Oil Well Cementing Co.*, 324 U. S. 320, and *Sinclair & Carrol Co.* v. *Interchemical Corp.*, 325 U. S. 327.

In both decisions of this Court, the patent was based upon the use of a chemical to perform a chemical objective which the chemical was known to be capable of performing.

In the present case, urea is added to the antiperspirant in order to perform two functions which were essentially antagonistic to each other, and only one of which was a known function of the chemical.

An antiperspirant is effective because of its acidity. There are, however, secondary effects of this acidity which are harmful. Particularly, the astringents used will attack clothing. They will also injure the skin of certain sensitive individuals.

It was well known that urea would overcome these secondary effects. This was true of countless other materials which also have the ability to neutralize acids.

The difficulty was that the other materials which neutralized acids also prevented the antiperspirant from working, since they neutralized the primary acidity as well as the secondary acidity.

There is even today, except for the Wallace and Hand patent, no chemical teaching which would indicate that urea and its analogues would solve this dilemma, and even the Wallace and Hand patent did not discover why urea would permit the antiperspirant to retain acidity and yet neutralize the after-effects.

As defendant's expert said (Rec. 75):

> "the peculiarities of urea are such that the literature is not certain what happens with many straight compounds, let alone those that go into reversal."

It is believed that there is no necessary conflict between the decisions of the Second Circuit Court of Appeals and the Seventh Circuit Court of Appeals, in view of the differences in the records. There is no conflict between the decisions of this Court and that of the Seventh Circuit Court of Appeals.

Respectfully submitted,

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February 28, 1948.

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Supreme Court of the United States

OCTOBER TERM, 1948.

16

MANDEL BROS., INC., a corporation, Petitioner,
vs.
JOHN H. WALLACE, JR., Respondent.

No. 16

BRIEF FOR RESPONDENT.

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1948.

MANDEL BROS., INC., a corporation,
Petitioner,
vs.
JOHN H. WALLACE, JR.,
Respondent.

No. 16

BRIEF FOR RESPONDENT.

To the Honorable Chief Justice and Associate Justices of the Supreme Court of the United States:

OPINIONS OF THE COURTS BELOW.

The opinion of the Seventh Circuit Court of Appeals in this case is reported at 164 F. (2d) 861. The District Court opinion appears at 67 F. Supp. 814.

The opinion of the District Court of New York in the case of *Wallace* v. *Woolworth* was reported at 45 Fed. Supp. 465. The opinion of the Second Circuit Court of Appeals in that case is reported at 133 F. (2d) 763.

JURISDICTION.

Jurisdiction arises from a Writ of Certiorari granted March 15, 1948.

STATEMENT OF FACTS.

Substantially every fact asserted by the Circuit Court of Appeals of the Seventh Circuit is also backed up by a finding of fact of the District Court. Substantially every allegation made in this brief is based upon a concurrent finding of the District Court and the Court of Appeals. Findings of Fact 7 to 12, inclusive, and 18 and 19, pp. 146, 147 and 148, cover the gist of the case.

Under the established rule of this court, as set forth in *Williams* v. *United Shoe Machinery Corp.*, 316 US 364, and *Goodyear* v. *Ray-O-Vac*, 321 US 275, such findings will not be disturbed.

While there are several material misstatements of fact in the Statement of Facts of Petitioner, clarity and brevity will best be served by discussing these points in connection with those portions of the argument to which they apply, rather than at this point, out of their context.

SUMMARY OF ARGUMENT

The Invention

Aluminum chloride and aluminum sulfate are acid reacting salts. Because of this acidity, they are both corrosive and perspiration inhibiting. Reducing the acidity reduces perspiration inhibition. Urea, like other anti-acids, was known to react with acids, like sulfuric acid, and reduce both their acidity and corrosiveness. If it acted in the same way with these acid salts, as would be expected, it would be worthless in an anti-perspirant. Other anti-acids act with these salts to reduce both acidity and corrosiveness. Urea reduces only corrosiveness, which was not only unpredictable, but cannot yet be explained. As a result, unlike other anti-acids, it can be added to an anti-perspirant without reducing the anti-perspirant effect, and yet stop corrosion. (Findings of Fact 8, 12, 18 - pp. 146, 148.)

The need for a non-corrosive anti-perspirant had existed for a long time. (Findings of Fact 7 and 10; R. 146.)

The Invention Satisfied a Long Felt Want.

Commercial acceptance was prompt and secured without unusual advertising. The Court of Appeals below found that the invention completely satisfied the need. (P. 193)

Corrosion was a Serious Problem.

The unprotected anti-perspirant cannot be used immediately after shaving. It rots the clothing slowly at room temperature, and immediately at ironing temperature. (Physical Exhibit 4, Finding of Fact 10, p. 146.)

The Prior Art is Completely Irrelevant.

It shows nothing more than the admitted fact that urea was known to react with acids and reduce their corrosiveness. It did not show that urea would act differently with a corrosive acid salt than it did with an acid, and differently than other anti-acid materials acted with acid salts.

The alleged prior use of the patentees was of a product which did not contain urea. Urea and an acid were mixed to make it. The uncontradicted testimony is that the urea reacted and disappeared. (p. 133) While the urea reduced corrosiveness it did so only at the expense of anti-perspirant value. If the urea acted the same way with an astringent salt, it would be worthless. Every court which has passed on the subject has found against Petitioner on this alleged anticipation.

Shipp patent 2,174,534 is irrelevant because it merely shows the addition of urea to strong sulfuric acid to slow down, but not stop, its corrosion on cloth. The urea reacts with the acid. No acid salt is involved so that the patent cannot teach how urea will behave with an acid salt. If it behaved as in Shipp, it would be worthless in an anti-perspirant. The other things that work in Shipp and are said to be the equivalent of urea, do not work in an anti-perspirant.

The slowing down of the attack of concentrated sulfuric acid on cloth is entirely non-analogous to the use of an acid salt on the skin.

Hutzler v. *Sales Affiliates,* 164 F. (2d) 260, 264 (CCA 4).

Deer Co. v. *U. S. Slicing Machine Co.,* 21 F. (2d) 812 (CCA7).

Smith v. *Snow,* 294 US 1, 17.

Koch 2,011,292 does not use urea to stop corrosion. He claims to use it to stabilize a solution of aluminum acetate. It is claimed to be the equivalent of borax for this purpose, and thus cannot teach that urea would act differently than borax with an anti-perspirant. Borax is worthless in an anti-perspirant.

Missbach 2,011,711 shows merely the admitted fact that urea neutralizes acids.

The New York decision is on a different record. There was no proof of long felt want. The court failed to understand the distinction between acids and acid salts.

There is Invention.

This court has never departed from the doctrine that doing more than is expected of one acquainted with the business is invention. *Hotchkiss* v. *Greenwood*, 11 How 248. *Goodyear* v. *Ray-O-Vac*, 321 US 275.

In the present case not only did urea act in an unexpected manner, but even in this record there is no teaching as to why urea acts differently with acid salts than other anti-acids do.

ARGUMENT.

1. The Invention.

The unpredictable discovery, which resulted in the present invention, is the fact that urea behaves differently with an acid than with an acid (astringent) salt.* Both acids and acid salts, in water, produce hydrogen ions, and their acidity and their corrosiveness are due to the presence of these hydrogen ions. As we have pointed out at length in the Appendix, the hydrogen ions from acids and acid salts are identical and there was no prior art of any kind to indicate that urea would act differently with the hydrogen ions from an acid than with the hydrogen ions from an acid salt. Urea, like all other basic materials, reacts with an acid and forms a compound. Urea does not react with an acid salt, whereas ordinary basic materials do. No one has been able to explain the reason for this distinction and yet if it were not for this difference urea would not be of any value in an anti-perspirant.

There was no known law or even an indication that urea would fail to react with an acid salt. Its reaction with acids was well known. The reaction of basic materials generally with acid salts was known. It is Respondent's position that any chemist would have assumed that urea

*An acid is a substance which contains hydrogen in such a form that it will form hydrogen ions in water. Examples are HCl and H_2SO_4. We have used the term acid salt to indicate a salt, like aluminum chloride, $AlCl_3$ where the hydrogen has been replaced by a metal. The salt does not contain hydrogen but in the presence of water produces an acid reaction by hydrolysis with water. The chemistry of this reaction is explained in the appendix.

would also react with an acid salt, and it was only by going contrary to what should have been thus assumed, that Wallace and Hand made their discovery.

No routine experiment would have led in this direction and no routine experimenter would have thought of making this combination. It would have seemed obvious to him that it would not work. He should have expected that the urea would combine with the acid salt and destroy its needed astringency as well as its corrosiveness in the same way other anti-acids do.

The patent[1] covers the combination in an antiperspirant, of a normally corrosive, astringent salt, such as aluminum chloride, with an amino compound such as urea.[1a] Both corrosion and anti-perspirant effect are due entirely to the acidity of the salt[2]. Urea has the property, still unexplained, of inhibiting against the acid corrosion without affecting the acid antiperspirant capacity of the salt. No other substances are known which have this paradoxical property. No prior art used urea with a corrosive acid salt, or hinted that it might solve the problem of actively inhibiting the corrosive action but not the antiperspirant effect of the salt's acidity.

2. The Need for a Non-Corrosive Anti-Perspirant.

Cosmetic preparations for the removal or prevention of the odors of perspiration have been made and sold for a long time. (Findings of Fact 7 and 16, pp. 146-7.)

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[1] R. 167.

[1a] Since the preferred amino compound is urea and all parties use it, we focus our discussion on it. The patent shows others of this group to be operable but they are not and have not been in issue.

[2] Findings of Fact 8, 9, 10, R. 146.

The modern compositions for preventing perspiration odors fall into two classes, deodorants and antiperspirants. Deodorants, which are probably the older, do not seek to stop perspiration, but, so far as they can, mask its odor or attempt to overcome it.

Antiperspirants, into which class the patent in suit and the petitioner's composition fall, attack the problem by inhibiting the flow of perspiration sufficiently to overcome perspiration odors. They likewise reduce or eliminate contact of perspiration with clothing.

Deodorants were sometimes supplied as creams, as for example, the well known deodorant "Mum". (Finding of Fact 7, p. 146.) The record shows no successful antiperspirant cream prior to plaintiff's patents. The earliest antiperspirant commonly known to the public was "Odorono", which was supplied as a liquid.

3. Acidity Is Necessary in an Antiperspirant.

Perspiration inhibiting compounds depend upon the acidity (astringency) of a salt.[3] The aluminum salts of strong acids, especially aluminum chloride and aluminum sulfate, the aluminum salts of hydrochloric acid and sulfuric acid, respectively, are usually employed. The antiperspirant in order to be effective, must be strongly astringent, and the degree of astringency is determined by the acidity of the salt. This acidity is measured by chemists in terms of the concentration of hydrogen ions in solution, which is technically given the symbol pH.[4] Acidity is caused exclusively by the presence of hydrogen ions—that is positively charged hydrogen ions which exist in solution (H^+). The pH or concentration of these ions can range from 0 to 14, 7 representing the neutral point.

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[3] Finding of Fact 8 R. 146.

[4] Finding of Fact 8 and 9 R. 146.

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A pH of 0 represents the highest possible acidity. Thus the lower the pH, the higher is the acid character of acidity of the solution. Any substantial increase in pH in an antiperspirant results in a loss of astringency and effectiveness.[5]

This acidity, or pH of the solution, which is necessary in order to make a salt astringent, and, therefore, is necessary for its effectiveness as an antiperspirant, we have called the primary acid effect of the aluminum salts of strong acids.

The insurmountable difficulties which had existed in all antiperspirant compositions prior to those here patented, was that astringent salts, such as aluminum chloride, are, because of their acidity, corrosive to fabrics, slowly at body temperature, and rapidly under the heat of ironing.[6] They are also very irritating to the skin of some users. (i.e. "Odorono" advises its users not to employ it until 48 hours after shaving.) These difficulties we refer to as the secondary acid effects.

Petitioner seeks to minimize the effect on the skin by referring to the New York case, in which the testimony was different. The uninhibited material does affect some skin, and, as shown by the "Odorono" directions, should not be used on any skin which is in an abraded condition such as after shaving. (See physical Exhibit 4, introduced at p. 15.) Finding of Fact 18, p. 147, finds irritation to the skin.

In contrast to Petitioner's indifferent attitude toward the subject of skin irritation, we refer to Goodman's Cosmetic Dermatology, p. 438, cited by Petitioner in its

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[5] Finding of Fact 8; R. 146.

[6] Finding of Fact 10 R. 146.

answer, p. 8, and printed at p. 167 of Physical Exhibit 9, which says, (as of 1936)

> "We still await a safe physiological agent to serve the purpose of decreasing the amount of the unwanted perspiration."

Both desirable primary, and undesirable secondary effects are due to the presence of the same H^+ ions.[1] The concentration of the ions had to be retained for astringency, but its effect had to be overcome as against corrosiveness.

The antiperspirant industry was therefore confronted with a problem which appeared incapable of solution. They had to retain the acidity of the astringent material for the purpose of reducing perspiration—that is, retain the primary acid effect of the salts, and yet they had to eliminate the secondary acid effect which resulted from the acidity of the salts and which caused corrosion and irritation. Mechanically it seemed as absurd to try to solve this problem in the way Wallace and Hand did as it would be to dull a razor blade in order to avoid cutting one's face in shaving. Corrosiveness normally is an inevitable consequence of the low pH which is produced by strong acids or their salts with weak bases. Wallace and Hand had to have the low pH—yet wanted to avoid corrosion.

It was quite obvious that corrosion could be reduced by adding anti-acid materials, for example, bases or alkaline materials like borax. Such materials will eliminate corrosiveness by raising the pH of the material, which lowers its acidity. Unfortunately, and quite obviously, they also eliminate the antiperspirant effect, because in the same degree that they reduce acidity and corrosion, they reduce the astringency of the material.

---

[1] Finding of Fact 9 and 10 R. 146.

As the District Court found*:

> "Any substantial increase in pH results in a loss of astringency and effectiveness. * * * The corrosive effect could be overcome by the addition of alkaline substances, but such a compound would be valueless as an antiperspirant.
>
> "Urea when added to a solution in the proportion shown in the patent of an acid reactive salt like aluminum chloride, does not materially affect the pH of the salt. In this it differs from alkalis like borax."

Compromises were made in which both corrosiveness and antiperspirant effectiveness were partially reduced, but this was no solution to the problem. (Finding of Fact 18, p. 146, 147. See also p. 309-10 of New York record.)

Wallace and Hand solved the problem by the amazing discovery that urea, which was known to neutralize acids, did *not* neutralize acidity in the required acid antiperspirant salts, whereas other basic materials like borax reduce acidity in both acids and acid salts.

It was known by those skilled in the art that urea, when added to acids as distinguished from acid forming salts, combined with the acids and prevented them from being corrosive. This alkaline property of urea was known. There is, however, no teaching in the prior art that urea could be added to an acid salt without affecting its astringency, or that when added to an acid salt it would affect the later produced corrosiveness of such an acid salt. There is no prior art even relating to a corrosive acid salt and urea.

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* Findings of Fact 8, 12 and 18 R. 146, 147, 148.

4. The Invention Satisfied a Long-felt Need.

Commercial acceptance was prompt. There was a widespread need for a non-corrosive antiperspirant. The introduction of such a product not only led to greatly increased sales of the products under license, but it also caused a substantial reduction in the proportion of the business formerly enjoyed by deodorants. As the Circuit Court of Appeals said, it completely filled the need. [8a]

The two licensed commercial products known as "Fresh" and "Arrid" increased from about 4.5% of the total deodorant and antiperspirant business in 1937 to over 45% in 1945. In the same time, Odorono dropped from 19% to 6%, and the deodorant Mum dropped from 53.5% in 1938 to 28.8% in 1945. The amount of Odorono in 1937 was four times the combined total of Fresh and Arrid, whereas in 1945 the situation was more than reversed. Fresh and Arrid together sold seven times the total of Odorono in that year. These figures are taken from an unprejudiced survey made by Modern Magazines.[9]

The use of Fresh increased from less than 7,400 lbs. in 1937 to over 325,000 lbs. in the 11 months of 1945 for which figures were available.[10] The sales of Arrid increased correspondingly from 65,000 lbs. in 1937 to 1,122,451 lbs.[11] in 1944. As the Circuit Court of Appeals found, there is no question as to the commercial success of the product. (Rec. page 193).

> "In this respect the evidence is convincing that Wallace's composition was tremendously successful commercially. The evidence discloses clearly an exist-

[8a] There is no proof of a single failure.

[9] Exhibit 15, R. 139.

[10] Teller R. 24.

[11] Wallace R. 114.

ing public demand for a compound possessing the desirable qualities mentioned and a fulfillment of that demand by the patented product."

The licensed products were advertised, but there is no indication that the amount of advertising was more than normal in the highly advertised cosmetics business. Odorono and Mum are also well known to be extensive advertisers,[12] but their business decreased relatively.

Petitioner repeatedly states that there was no substantial difference between the New York record and that of the present case. The fact is that no effort was made in the New York case to prove a long felt want or commercial satisfaction of that want. This difference is clearly brought out in the opinions of the respective courts. The New York court found on its record that there was no long-felt want, and this finding of fact is not before this court. The Circuit Court of Appeals of the Seventh Circuit, from whose decision this appeal is taken, found flatly that proof had been made of a demand and a commercial satisfaction of that demand. R. 193. No assignment of errors was made as to this point. This is certainly a difference in the records and we believe it may well have accounted for the difference in the two opinions.

5. Corrosion was a Serious Problem.

Petitioner attempts to belittle the defects of the prior art, although these are specifically covered by Finding of Fact 18 (R. 147). We refer to a few facts to show the character of the corrosion problem.

A cream is obviously much more desirable for an antiperspirant composition than a liquid, since it can be applied more readily, does not spill, may be transported in a purse with safety, and has a much greater sales appeal.

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[12] Reber R. 30.

A corrosive cream, however, is immensely more destructive to skin and to fabrics than is corrosive liquid. A cream does not dry out, but retains its plastic properties when applied to the skin. Therefore, some of the cream is certain to be transferred to the clothing, and is thus more effective in rotting the fabric. A liquid on the other hand, may be applied and if permitted to dry does not readily rub onto the clothing. A striking indication of the need of a cream and the tremendous importance of non-corrosiveness is shown by the label on the "Odorono" bottle, one of which is before this Court as plaintiff's Exhibit 4. The label states as follows:

> "First bathe underarms and dry well. Pat Odo-Ro-No on freely; let it dry thoroughly (15 to 20 minutes). *Rinse well to protect clothing.* (Can be used *before* removing hair or 48 hours *after* shaving)."

Obviously these instructions are given with reluctance. No merchandiser will overemphasize the difficulties of using his product. It may, therefore, safely be assumed that the label states the very minimum in safety requirements for the use of "Odorono." If the directions are followed, it becomes impractical to use the product. The directions are for underarm application. The material is applied wet, and if used as directed, must dry for 15 to 20 minutes. Underarm liquid will not dry if the arms are held in a normal position, so that they should be elevated for the 15 or 20 minutes. Certainly not many have sufficient patience to do so.

One is also advised to wait 48 hours after shaving. One must remember on Thursday to prepare for Saturday. On Saturday there will be two days' growth of hair.

Petitioner asserts that the only improvement lies in the use of an antiperspirant cream. It states that urea is not used with liquid antiperspirants. It offers no support for this statement and there is no support for it in the record.

No attempt was made by either party to show whether liquid antiperspirants treated with urea were on the market. If this had been an issue it could have been shown that such compositions have been, and are being, marketed by Mandel Brothers, as Five Day Pads and Stopette.

There was, of course, no invention in making the antiperspirant in cream form. "Mum" had been available as a cream as long as can be remembered. The desirability of a cream was obvious—the difficulty was that it had to be non-corrosive.

Rotting of clothing is of very serious concern. With aluminum chloride, it will occur immediately at ironing temperature, and in a few days at room temperature. Physical Exhibits 11-14 are samples of cloths treated with astringent salts and then ironed. Of these, numbers 12 and 14 were protected by urea, and the others were unprotected. The corrosion of the unprotected samples is caused by the acidity of the astringent material. At room temperature it will occur in time even though the clothing is several inches from the aluminum chloride itself, as was shown by the test described at record 21 by Mr. Teller. He placed crystals of aluminum chloride in the bottom of a four-ounce bottle, and wrapped a piece of cotton sheeting around the cork of the bottle. After about three weeks the cloth and cork were removed, and the cloth was damaged as seriously as the samples which had been ironed.

The foregoing testimony proves beyond doubt the incorrectness of Petitioner's assertion that corrosion is a problem only at higher temperatures. As with many others of Petitioner's allegations, they are raised for the first time in the Supreme Court, and no expert testimony was offered in the lower court on this point other than the factual testimony just referred to. Petitioner's position contradicts Findings of Fact 18, p. 147, and 10, p. 146.

6. The Prior Art Is Completely Irrelevant.

No prior use shows the use or knowledge of urea to reduce corrosion without correspondingly reducing acidity. No prior art shows the use of urea with a corrosive acid salt for any purpose.

A. The alleged prior use by Wallace and Hand.

No article containing urea was sold more than two years prior to the application for patent, nor did Wallace and Hand ever, prior to the invention in suit, market urea with an astringent salt, or use urea in a manner where it reduced acid corrosiveness without correspondingly reducing acidity.

Not one of the four lower courts found that the alleged prior use by Wallace and Hand was an anticipation. In spite of this fact, petitioner chooses to place its main emphasis on this work. When understood, as the courts below have understood it, it has no relevance at all to the issues here.

The alleged prior use by the patentees reduces itself to this. More than two years before they filed their application, the patentees made and sold an antiperspirant which was at all times corrosive. This compound consisted of a very complex resin of formaldehyde and a sulfonic acid (Rec. 121). This material was an acid and not an acid salt and this distinction is carefully noted by Mr. Wallace on p. 121. The composition was found to be corrosive. Because of that fact, urea was ultimately added to it. The sulphonic acid reacted immediately with the urea, consuming it completely and having its own acidity reduced correspondingly. The testimony to the effect that the urea was completely removed by reaction will be found at pp. 128, 133 and 135. There is not one word of contradictory

testimony in the record. Petitioner's own expert even admitted that urea reacts with acids (p. 89, A. 345).

It was found that the addition of the urea so reduced the acidity of the acid as to destroy its value as an antiperspirant and for this reason some aluminum sulfate was then added. Of course, there was no urea present at any time that aluminum sulfate was present.

We emphasize this because Petitioner repeats over and over again that urea was present in this old "Arrid" composition. The nebulous theory upon which it reaches this conclusion is through an advertisement unconnected to Respondent, which said that the early "Arrid" was noncorrosive. The fact is that it was corrosive and was refused the seal of acceptance of the Good Housekeeping Institute because of that fact (pp. 133-4).

The urea which had been put in the composition was gone in the same way that coal which has burned is gone from a furnace, and that baking powder disappears from biscuits during baking.

In the present case, not only had the urea disappeared by reaction, but it had failed in its intended purpose since it reacted with the acid and reduced its astringency as well as its corrosiveness.

In discussing this prior work, Petitioner refers to acids and acid salts as if they were one and the same thing. As we have pointed out, they are not, and it is the difference between them which is the whole basis for this case. Urea reacts with acids. It does not react with their salts to raise their pH even when these salts are acid. It is easy to be confused, and apparently counsel for Petitioner have been confused on this point. For example, they state on p. 34 of their Brief, that the claims of the patent in suit cover the sulfonic acids of the early "Arrid". The patent covers astringent salts of such acids, but not the acids themselves.

If Petitioner's Brief, at p. 34, is read carefully, it will be found to say just that, but the implication is that there is no difference between acids and acid salts.

Petitioner makes one other comment with respect to this alleged prior use which is new. It says that urea reduced acidity of the acid less than other bases would have done. We find no record support for this statment. It is true only to the limited extent that it takes more urea by weight to achieve a given reduction in acidity than it does with stronger bases, such as sodium hydroxide or borax. In all such cases the reduction in corrosiveness and the reduction in acidity go hand in hand.

The surprising thing is, that Wallace and Hand should have tried urea after it had failed them in the early years. The fact that they had urea at hand and tried it, is no argument against invention, since that is purely a subjective and fortuitous happening. Invention is weighed, not in the light of the particular individuals concerned, but with respect to the unobviousness of the solution generally to those skilled in the art. If this were not the case, then no accidental discovery could be an invention. Mr. Goodyear's vulcanized rubber was no less an invention because he happened to have a stove, sulfur, and rubber all handy.

There was nothing in this case to lead Wallace and Hand to try urea as distinguished from any of the countless other anti-acids which were available.

B. Shipp—2,174,534 (p. 175)

The Shipp patent shows merely the addition of urea to concentrated (65-98%) sulfuric acid in order to slow down momentarily its action upon a textile material. It was found by the Circuit Court of Appeals not to show the present invention and to be from a non-analogous art.

It relates to a composition which could not under any stretch of the imagination be used on the skin. It does not relate to an acid salt but to an acid. It merely shows a slowing down of the action of the concentrated acid.

If urea acted on aluminum chloride or aluminum sulfate as it does on the sulfuric acid of Shipp, it would be useless in an antiperspirant.

Shipp was dealing with the old problem of mercerizing cotton. Cotton was first mercerized by the use of caustic alkalis. Eventually it was discovered that similar results might be obtained by the use of concentrated sulfuric acid. (See Encylopedia Britannica Vol. 15, p. 264, 1941). Mercerization is a chemical change of the cotton, and if the chemical change is permitted to go too far, the cotton will be completely destroyed. Concentrated sulfuric acid is particularly valuable for mercerization because it permits the fibres to be made transparent but its action is so rapid that it is very difficult to operate within the normal time limits. Shipp was seeking a way to slow down the rate of reaction without inhibiting its extent. Concentrated sulfuric acid acts primarily as a dehydrator rather than as an acid.[14] Dehydration is the removal of water from within the molecule of the product. If carried to its utmost it would result in a charring, similar to the well known reaction of concentrated sulfuric acid on wood, sugar, or cellulose.

Because the reaction is dehydration the presence of ex-

[14] R. 96.

cess water is to be avoided. The concentration of the acid can be from 65 to 98%. At each level of concentration the effect differs slightly, but urea is required at all effective levels. Shipp prefers the most concentrated acid. But even a 65% sulfuric acid is a very concentrated acid. Shipp himself points this out at p. 175, column 2, lines 38-43. Hydrochloric acid is considered concentrated at 30%, and cannot be made to exceed 40%. See *Dow* v. *Halliburton*, 324 U. S. 320, 322.

A common method of slowing down a rate of reaction without changing its extent is to add a diluent. In the case of Shipp, the diluent merely had to be one which did not contain or produce water. It did not matter whether the pH of the acid were changed, or even whether a reaction occurred with the acid, if the resulting product still had the same properties for mercerization purposes.[15]

Therefore, Shipp includes many chemicals which will act as non-aqueous diluents, such as common ethyl alcohol, methyl alcohol, and acetone, as well as many other related materials. They do not work in an antiperspirant.[16]

Therefore, Shipp merely taught, as he expressly shows, that urea was the equivalent of organic bases, of ethyl alcohol, methyl alcohol, acetones, and countless other substances as a diluent in combination with sufuric acid. This is not a teaching of retaining acidity for one purpose while

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[15] Concentrated sulfuric acid is practically un-ionized—i.e. it produces practically no hydrogen ions—and therefore is not a true acid. There are more H ions in 70% acid than in 97% acid—yet Shipp uses decidedly less urea at the 70% level. See Mellor Inorganic and Theoretical Chemistry, Vol. X. p. 412. The ionization is measured by the conductivity of the solution which is more than four times as great at 70% as at 97%. This lack of hydrogen ions is why iron vessels may be used to store concentrated acid, while they cannot be used for dilute acids. Shipp mentions this fact at p. 178, col. 2, lines 21-22.

[16] Opinion of Court of Appeals R. 196 Teller R. 96.

overcoming it for another. There was no desire to have or retain acidity as such, nor was there any idea of overcoming its effect. It was purely a retarding situation wherein the rate of reaction was slowed down so that for sixty seconds or so one could proceed with the reaction.

Shipp does not show an anti-acid which does not reduce acidity. There is no teaching in Shipp that corrosion could be entirely overcome by urea, nor a teaching that if corrosion were entirely overcome the acid would have any value. The evidence is actually to the contrary. Urea will react with sulfuric acid, and reduce acidity, Finding of Fact 12, p. 146, but this does not produce an antiperspirant any more than Missbach's dry cleaner produced an antiperspirant. "Any amount of urea that conceivably could be added and still maintain the parchmentizing effect of the acid would not protect fabric from corrosion. It would merely delay the corrosive action."[17]

Nor does urea act in the same way with aluminum chloride or aluminum sulfate that it does with sulfuric acid. If it did, it would be of no value in an antiperspirant.

Wallace and Hand's problem was entirely unrelated. They were not concerned with acids at all. They were dealing with astringent or acid forming salts. It was known all along that the addition of urea to acids would overcome their acidity. There is no teaching in the record either in Shipp or anywhere else that the addition of urea to a corrosive astringent salt would overcome corrosiveness of that salt *without* reducing its acidity. Shipp is not even concerned with an acid salt. He, therefore, cannot teach the all important feature that urea will act differently with an astringent or acid salt than it will with an acid or that it will react differently with an acid salt than other anti-acids.

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[17]Teller R. 97.

C. Koch—2,011,292—(R. 171).

Koch does not add urea to anything to overcome corrosiveness. No ingredient used by him is corrosive. He added urea to stabilize an unstable non-corrosive salt, but in this he was unsuccessful. There is nothing to indicate urea would act differently than an anti-acid like borax. As the Circuit Court of Appeals for the 7th Circuit said, page 194:

> "Koch was coping with the problem of a stable solution of aluminum acetate and aluminum formate."

Aluminum acetate and aluminum formate are non-corrosive substances used as mordants in the dyeing of fabrics. Both have a tendency to decompose in water and form insoluble products. The salts, the acids from which they are formed, and the insoluble products are all harmless to clothing.

Koch added urea in an attempt to prevent the formation of the insoluble precipitates. He did not accomplish this purpose, as Mr. Teller testified (Rec. 102). Even defendant's expert, Mr. De Navarre, admitted that if Koch worked in the manner claimed by him, there would be more decomposition rather than less (Rec. 74). Mr. De Navarre wrote a book some years after Koch was issued in which he stated that aluminum acetate cannot be stabilized except by borax. (R. p. 74) Therefore, if urea did stabilize aluminum acetate, it would not act differently than borax (an alkaline material which fails in an antiperspirant, p. 146 Finding 12). This does teach a difference in the action of borax and urea.

In spite of these facts, petitioner claims that Koch uses urea to prevent corrosion, relying upon a statement in

column 1, lines 37-42 of the patent (Rec. 171), which is as follows:

> "The solutions of these products may be used with special advantage in the textile industry because they do not contain any substances which would have detrimental effect when used, for instance, for impregnation purposes."

The statement is literally and factually true. Not one ingredient of the mixture is detrimental to cloth. Urea is not needed to make some normally harmful salt harmless (Rec. 103) because no harmful salt is present.

Petitioner relies upon Mr. de Navarre's testimony that aluminum acetate would deteriorate cloth. This was contradicted by Teller (Rec. 103); and on cross-examination de Navarre admitted that he had no basis or experience for his testimony. (See Q. and A. 145 and 148 on Page 72).

It was in connection with the Koch patent that Mr. de Navarre, trying to justify his testimony, finally asserted "The peculiarities of urea are such that the literature is not certain what happens with many straight compounds, let alone those that go into reversal."[18]

D. Missbach—2,069,711—(R. 173).

This patent merely shows the use of urea to neutralize an acid—not an acid salt. There was no need to preserve acidity, and other bases or anti-acids would have served as well as urea. In fact, some of the materials shown by Missbach as equivalents of urea are the usual type of basic materials which would be completely worthless in an anti-perspirant. This is true for example of the guanidine materials disclosed on page 174. This was pointed out by Mr. Teller at page 96.

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[18] R. 75.

7. Non-Analogous Art.

An inventor is conclusively presumed to know the prior art in his own and clearly allied fields of endeavor. This, of course, like the rule that one is presumed to know the law, is a legal fiction. It is imposed so that one cannot claim as an invention what he might reasonably have learned by the exercise of a normal amount of ingenuity. As the field of science has grown, and the size of the libraries has multiplied almost infinitely, this has put a growing burden upon the inventor.

When it comes, however, to assembling bits of knowledge, which when put together might suggest a solution, the courts have reasonably and intelligently drawn a line.

Information which does not directly anticipate an invention, must have been learned in an art which is analogous to that in which the invention is made. This simply means that the information must either have been in the same art or business as that in which the inventor is working, or in an art which is so analogous that any reasonable person might have been expected to look there.

As was said in *A. J. Deer Co., Inc.* v. *U. S. Slicing Machine Co.*, 21 F. (2d) 812 (CCA 7):

> "If elements and purposes in one art are related and similar to those in another art, and because and by reason of that relation and similarity make an appeal to the mind of a person having mechanical skill and knowledge of the purposes of the other art, then we are of the opinion that such arts must be said to be analogous, and, if the converse is true, they are non-analogous arts."

The Circuit Court of Appeals for the Fourth Circuit found that the removal of hair from animal hides, and the removal of hair by the same group of compounds from

human skin, were not analogous, partially because the times involved in the two processes were quite different. *Hutzler Bros. Co.* v. *Sales Affiliates,* 164 F. (2d) 260, 264. The use of copper to absorb ammonia in a gas mask was found non-analogous to the use of the same material for the same purpose in illuminating gas. *Yablick* v. *Protecto Safety Appliance Corp.,* 21 F. (2d) 885, 886 (CCA 3).

This court found that apparatus for conditioning tobacco and other materials, as well as other procedures for ventilation, were quite remote from the problems and the procedure for ventilating incubators for the hatching of eggs. *Smith* v. *Snow,* 294 U. S. 1, 17.

So with the Shipp patent. It dealt with the application of concentrated acid to cotton cloth. The urea reacted with the acid. It managed to slow up but not to stop the disintegrating effect of the acid. There is nothing in what he did which would suggest an answer to the problem presented to Wallace and Hand. The information in Shipp was not even available to the public since it was not published until three years after Wallace and Hand made their discovery.

No one dealing with an antisperspirant would think of looking for help in such a process.

Wallace and Hand Made a Patentable Invention.

This is one of those rare cases where the discovery appears simple to the uninformed but inexplicable to the expert. Many things are mysterious to the uninformed. In the present case, however, once urea has been found to do the trick; it is easy to make it seem simple; and it is only on thorough understanding that the problem is brought into its true light.

For that reason we have included an appendix in this brief setting forth the chemical background of acid formation in water solutions. This is elementary chemistry, but it needs to be thoroughly understood to know why the selection of urea was completely unobvious.

Acidity is measured by pH, which is simply hydrogen ion concentration. As the court found, the lower the pH, the greater the acidity (p. 146). This is true of acids and of acid reacting astringent salts like aluminum chloride.

All known basic or anti-acid materials lower the acidity of acids. All anti-acids or basic materials except the urea group lower the acidity of acid reacting salts (Finding of Fact, p. 146). Urea does not, yet it protects the skin and cloth against corrosion from such salts, either at room temperature or advanced temperature. There is no prior art showing that this property of urea was known. In the absence of such knowledge there is nothing which would have led the patentees to try urea.

8. The New York Decision, 133 F. (2d) 763.

The New York decision makes a number of statements which, at least upon the present record, are entirely incorrect.

It finds that there was no long felt want. This finding was based upon the absence of proof of commercial success or of the problem involved. The Seventh Circuit

Court of Appeals found specifically that there was a long felt want (p. 193):

> "The evidence discloses clearly an existing public demand for a compound possessing the desirable qualities mentioned and a fulfillment of that demand by the patented product."

The Court of Appeals of the 2nd Circuit found that the invention came about as the result of routine experiment. This finding was based on a number of factors which were incorrect. The court found no long felt want, whereas we have proved one. It referred to Killian as an independent inventor, whereas he was Wallace's helper at a later date and is not even cited here. It cited a Montenier patent as prior, whereas it was antedated by Wallace and Hand in both cases. Actually, as we have pointed out, a routine experimenter would never have tried urea. The known properties of urea indicated that it would work like other anti-acids or bases, and if it had worked like a base it would have been without value. Apparently the 2nd Circuit Court of Appeals failed to distinguish between acids and acid salts, and to notice that while other anti-acids acted the same with acids as with acid salts, urea did not do so. If the New York court had understood the true facts, its own language at p. 764 would have led that court to find the present discovery patentable. The court said:

> "This is not to say that such steps might not perhaps lead to invention, if the result was sufficiently unexpectable."

The present result is so unexpected that no one has as yet been able to explain it.

There Was a Long Felt Want.

The Court of Appeals specifically found the existence of a long felt want and its commercial satisfaction (R. 193):

> "We think, too, that the evidence discloses clearly an existing public demand for a compound possessing the desirable qualities mentioned and a fulfillment of that demand by the patented product."

No assignment of error was taken as to this finding of the court. While the evidence to support the finding is clear, as the Circuit Court of Appeals found, it is not one of the issues presented here.

There is no question as to the need for the noncorrosive antiperspirant. There is no question as to commercial success. Apparently even petitioner does not deny it. The commercial success was not achieved by any unusual advertising (p. 36).

The fact that urea could be used without reducing the acidity of an acid salt was completely unknown and unobvious from any prior art. This should spell invention. If there be any doubt, the long continued problem and its recognition should bring this case within the language of this court in *Goodyear* v. *Ray-O-Vac*, 321 U. S. 275 at 279:

> "During a period of half a century, in which the use of flashlight batteries increased enormously, and manufacturers of flashlight cells were conscious of the defects in them, no one devised a method of curing such defects. Once the method was discovered it commended itself to the public as evidenced by marked commercial success."

9. A Three Party Interference is no Evidence of Lack of Invention.

The existence of a three party interference is no indication of lack of invention.

Petitioner argues, at page 36 of its brief, that the existence of a three-party interference in the Patent Office proves lack of invention. That there may be cases where simultaneous discovery by a large number of persons can be evidence of lack of invention we do not deny. In the present case there is no evidence whatsoever that Montenier or Teller arrived at their disclosure independently of Wallace and Hand. But even if they did, Congress, at least, since as far back as 1870, has made specific provision for interferences between pending patent applications (Title 35, Section 52, U. S. C.). It is obvious that Congress did not consider simultaneous discovery as an indication of unpatentability. In the *Telephone* cases, 126 U. S. 1, 551, at least 5 different inventors were involved in interferences.

10. The Cases Cited by Petitioner.

Petitioner has cited a great number of cases, most of them merely prescribing known rules of law with which we have no quarrel. Each patent case stands largely on its own feet when the question of invention is to be considered, and we will therefore discuss only those cases of Petitioner which require some special comment on the facts.

The only test of invention was announced by this court in *Hotchkiss* v. *Greenwood*, 11 How. 248 in 1851, and has been acquiesced in by Congress since that time. A patentee must do more than would be expected of the ordinary person acquainted with the business. We have shown beyond a doubt that no one acquainted with the business would have considered it possible that urea would work differently than the other anti-acids.

Therefore any discussion of the cases relied upon by Petitioner need only be to indicate the inapplicability of the facts.

In the *Dow* v. *Halliburton* case, 324 U. S. 320, the problem was not the selection of a particular inhibitor: All inhibitors worked. Here other corrosion inhibitors were not successful. Furthermore, in that case, the court found that as soon as the need for an inhibitor arose, the usual inhibitors were employed.

The case of *Funk* v. *Kalo*, 333 U. S. 127, decided recently by this court, is urged by Petitioner as showing that there is no patentable combination in the invention here in suit.

In the *Kalo* case, the bacteria at no time affected the actions of each other, and therefore it might have been truly said that there was no patentable combination. In the present case, there is a true modification of the action of the salt whenever occasion arises where it might be corrosive. Whether this starts instantly in the container, or whether it is a delayed action, we do not know. Nevertheless, the experiment shown on page 21 of the record indicates that the urea modifies the action of the acid salt at all times. There, unmodified aluminum chloride in a bottle rotted cloth several inches away at room temperature—and did not do so when urea was added. This indicates an immediate and constant cooperation without reaction between the ingredients. But such continuous cooperation is not required for a true invention. It is enough that at the required times there should be such integration. Otherwise, to cite an obvious example, an automobile engine would only be a combination when actually running, and since it does not run all the time, would not be patentable.

Nor is this a case where Wallace and Hand discovered a natural law and applied it to an obvious use. There is still no known natural law by which urea would act differently with an acid salt than it does with an acid—or any known reason why it acts differently with an acid salt than do other anti-acids.

11. Petitioner's Specification of Errors.

Petitioner at p. 19 of its Brief, presents four alleged specifications of error. The first three of these specifications make it appear that the decision of the Circuit Court of Appeals of the Seventh Circuit was very much different from the actual decision.

Of course the issue here presented is the validity of the patent in suit. It, therefore, seems unnecessary to discuss whether Petitioner's specification of errors correctly analyzes the decision of the Court of Appeals. Nevertheless there are several misstatements in the Specifications which are quite misleading.

In the second Specification, for example, Petitioner states that the Court of Appeals found knowledge in the prior art that urea has the ability to inhibit corrosion in the presence of acid.

The Circuit Court of Appeals actually found the opposite. On p. 199 the Court found:

> "Shipp merely slowed up the disintegrating effect of the concentrate. He did not inhibit or bar it."

Secondly, the Specification states or implies that urea could be present in acid and still inhibit its corrosion. The evidence shows without contradiction that urea combines with acid and reduces its corrosiveness only to the extent that it does combine. In this respect urea is like all other anti-acids.

CONCLUSION.

That urea, unlike other anti-acids, has the unique power to inhibit corrosion without reducing the acidity of an acid salt was not only unpredictable but was directly contrary to what was expected by those skilled in the art.

Until this discovery by Wallace and Hand, that property of urea had never been observed or utilized in an antiperspirant or in any other product. In Wallace and Hand's earlier work with antiperspirants, some urea had been used with an acid and had reduced both the corrosion and acidity, as would be expected with an acid.

The invention resulted in a wholly new, safe and extremely popular antiperspirant, and the Court of Appeals for the Seventh Circuit should be affirmed in holding it patentable.

Respectfully submitted,

CHARLES J. MERRIAM,
BERNARD A. SCHROEDER.

October 5, 1948.

APPENDIX.

As we have explained in the brief, acidity, whether of an acid, or of an astringent salt, is due to and measured by, the presence of hydrogen ions. The concentration of the ions is measured in either case by the pH, which is low when the concentration of hydrogen ions is high. We will attempt in this appendix to give a simple explanation of how these ions are formed in the presence of water. Water is present, of course, in liquid anti-perspirants and in creams. The record basis for the explanation to be given will be found in the testimony of Mr. Teller at pages 18, 19, 91 and 92. It is not contradicted by Petitioner's Expert, and is the basis for several findings of fact, particularly 8, 9, 12, and 18. These will be found at pages 146 and 147.

When any salt, or acid, or base is dissolved in water it forms positively charged and negatively charged ions. For example, when aluminum chloride ($AlCl_3$) is added to water it dissolves and the dissolved material is almost completely ionized, one molecule of $AlCl_3$ dividing into one aluminum ion which carries three positive charges (Al^{+++}), and three negative chloride ions ($3Cl^-$). When ordinary salt (NaCl) is added to water the same thing occurs except that one positively charged sodium (Na^+)ion and one negatively charged chloride ion (Cl^-) are formed. It is the presenee of these ions which permits solutions of salts to carry electric current.[19]

The establishment of an acid solution from a salt like aluminum chloride is due to hydrolysis.

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[19] Teller 18, 19, 91, 92. See also Encyc. Brit. 1941, Vol. 5 p. 344; Vol. 11 p. 981.

When aluminum chloride is added to water, it becomes Al^{+++} and $3Cl^-$ ions.

$$AlCl_3 \rightleftharpoons Al^{+++} + 3Cl^-$$

Water itself is slightly ionized into positively charged hydrogen ions and negative OH ions.

$$H_2O \rightleftharpoons H^+ + OH^-$$

The number of hydrogen ions as compared to OH ions determines the acidity of the solution.

Strong acids like hydrochloric acid and strong bases like sodium hydroxide are almost completely ionized in normally dilute solutions as indicated by the following equations.

$$HCl \rightleftharpoons H^+ + Cl$$

$$NaOH \rightleftharpoons Na^+ + OH^-$$

All of these equations or ionizations are reversible, as indicated by pointing the arrows in both directions. That is, ions are always uniting to form acids, bases or salts and the acids, bases and salts are always breaking down into ions. In the case of salts, strong acids and strong bases, nearly all of the material is ionized all the time. In the case of weak acids and bases ionization is frequently very incomplete. For example, aluminum hydroxide is very slightly ionized. This means that if Al^{+++} ions and OH^- ions are both present in a solution they will tend to go together and form the un-ionized base.

With this chemical background it is possible to analyze what happens when aluminum chloride is added to water. The first reaction is that water itself is slightly ionized as follows:

$$H_2O \rightleftharpoons H^+ + OH^-$$

The aluminum chloride ionizes as follows:

$$AlCl_3 \rightleftharpoons Al^{+++} + 3Cl^-$$

Cross reactions also occur. The aluminum ions and the OH ions combine almost completely to form the very little ionized aluminum hydroxide:

$$Al^{+++} + 3OH \xrightarrow[\text{totally}]{\text{almost}} Al(OH)_3$$

On the other hand the hydrogen ions and the chloride ions combine very little to form hydrochloric acid. The result is that the OH ions are removed from the solution and the hydrogen ions are not.

The case of aluminum chloride in water is summarized below. Arrows in both directions indicates reversibility, and the relative size of the arrows indicates the predominative direction of the reaction.

$$AlCl_3 + 3H_2O \leftrightharpoons 3H^+ + 3Cl^- + Al^{+++} + 3OH^-$$

$$3H^+ + 3Cl^- \rightarrow 3HCl \qquad Al^{+++} + 3OH^- \rightarrow Al(OH)_3$$

It will be seen that aluminum hydroxide will build up, thus leaving an excess of hydrogen ions.

As a result the solution becomes almost as acid as a solution of hydrochloric acid itself as its low pH shows.

Hydrogen ions in a solution of an acid, and hydrogen ions in a solution of an acid salt, are identical and would be expected to react in the same manner with urea when it is added. The patentees discovered that this was not the case. No one yet knows why it is not the case.

As shown above, a solution of aluminum chloride con-

tains *all* the ions present in hydrochloric acid. Yet it behaves differently with urea.[1] It leaves the acid available and uninhibited for stopping perspiration, but for some reason stops its undesirable corrosiveness to the skin and to fabrics at all temperatures. We have discussed aluminum chloride because it is simpler, but aluminum sulfate acts in the same manner, forming sulfuric acid instead of hydrochloric.

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[1]See Finding of Fact 12, p. 146. See also the charts at pages 159-162 of the New York Record Physical Exhibit 9, and the testimony at pages 45-49 of that record explaining them. These were incorporated by reference of Dr. Wallace at p. 137 of this record. The charts show that urea decreases the conductivity of an acid by reaction but does not decrease conductivity of astringent salts.